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ORGANIC FARMING ACT OF 1982

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HEARING

BEFORE THE

SUBCOMMITTEE ON FORESTS, FAMILY FARMS, AND ENERGY

OF THE

COMMITTEE ON AGRICULTURE HOUSE OF REPRESENTATIVES

NINETY-SEVENTH CONGRESS

SECOND SESSION

ON

H.R. 5618

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[1] Resigned from committee Oct. 7, 1981.
[2] Elected to committee Dec. 16, 1981.

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ORGANIC FARMING ACT OF 1982

THURSDAY, JUNE 10, 1982

HOUSE OF REPRESENTATIVES, SUBCOMMITTEE ON FORESTS, FAMILY FARMS, AND ENERGY OF THE COMMITTEE ON AGRICULTURE,

Washington, D.C.

The subcommittee met, pursuant to notice, at 10 a.m., in room 1301, Longworth House Office Building, Hon. James Weaver (chairman of the subcommittee) presiding.

Present: Representatives Brown, Bedell, Daschle, Dorgan, Albosta, Marlenee, Hansen, Skeen, Morrison, and Chappie.

Staff present: Cristobal P. Aldrete, special counsel; Peggy L. Pecore, clerk; Christine D. Abram, Stephen T. Adams, Richard Fritz, Gerald R. Jorgensen, Francie Monaghan, Greg Skillman, and Kevin Kirchner.

OPENING REMARKS OF HON. JIM WEAVER, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF OREGON

Mr. WEAVER. The Forests, Family Farms, and Energy Subcommittee will be in session.

We are meeting today to hold a hearing on H.R. 5618, the Organic Farming Act of 1982, which has now been cosponsored by 21 Members of the House.

The companion bill, S. 2485, the Innovative Farming Act of 1982, has recently been introduced by Senator Leahy.

[The bill, H.R. 5618, and the report from the U.S. Department of Agriculture appear in the appendix.]

Mr. WEAVER. The increasingly complex and capital-intensive nature of modern farming has prompted many producers to consider alternative farming methods. In part, this desire for change is fueled by the skyrocketing cost of energy, petrochemically based fertilizers and pesticides. More importantly, there is a growing concern about the dramatic soil erosion and nutrient depletion often associated with many conventional farming practices.

We have passed the health food phase in organic farming, and we are now entering an era where the need to provide food at costs we can afford and without destroying the land and water base depends on using workable organic methods wherever appropriate. I am convinced there are plenty of farmers who would like to make the switch to more organic farming methods but who simply do not know where to start.

Any change from conventional agricultural practices entails a certain amount of risk, especially given the tremendous economic pressures that face family farmers today.

Consequently, we need practical demonstrations and proven research to help clear the way for farmers who want to cut their costs and grow a better product to boot. That is the purpose of the bill before us.

H.R. 5618 has two basic components. First, it would take advantage of existing research data as well as practical advice that can be provided by volunteers experienced in organic farming. It requires the Secretary of Agriculture to make such information available at local offices of the Cooperative Extension Service.

Second, it would establish six pilot research programs at land-grant universities throughout America. These programs would focus on improving organic farming techniques and developing economically sound methods to help conventional farmers utilize organic agricultural practices.

The results of this research also would be available through local extension offices.

In July 1980, the U.S. Department of Agriculture released its report and recommendation on organic farming. This study outlines significant concerns about the existing U.S. agriculture production system. According to this report, major problems confronting farmers and our agriculture system include, one, increasing costs and uncertain availability of energy and chemical fertilizers; two, excessive soil erosion, loss of soil, organic matter, and a resultant decline in soil production and tilth; three, degradation of the environment, including hazards to human and animal health from heavy pesticide use; four, demise of the family farm and localized marketing systems.

Indications are that even a partial shift to low-energy agricultural systems, including the use of more organic farming techniques, would alleviate many of these problems.

After the USDA report was issued, the Secretary received rapidly increasing numbers of requests for information and advice on organic farming practices. The reasons were energy shortages, food safety, reducing costs of production, and environmental concerns.

The purpose of the study was the need to gain a better understanding of organic farming systems, the extent of their use, why they were being used, the technology behind them, the economic and ecological impacts of their use, and to identify research and education programs that are needed.

The major recommendations of the report follow: One, the U.S. Department of Agriculture should establish a permanent organic resources coordinator and multidisciplinary advisory committee on organic agriculture to develop liaison between organic farmers, producer associations, and the USDA and to establish an interagency committee on organic agriculture with the EPA, the FDA, the NSF, and the Department of Education.

This will be one of the purposes of this hearing—to determine what steps the Department of Agriculture has taken to develop this type of liaison.

Two, develop materials for county extension offices and agents to assist them in providing services needed by organic farmers, such as information on crop rotations, green manure and cover crops, utilization of animal manure, and other organic wastes for nutrient recycling.

Three, foster development of direct marketing of organically produced foods; develop marketing systems to assure efficient distribution to a wide range of people and assure proper labeling.

The report's research recommendations include: One, investigate organic farming systems using a holistic approach. Current research and data on organic farming is piecemeal and fragmentary. There is a need to investigate the complex chemical and microbiological interactions that take place in organic farming systems as well as their relationship to organic waste recycling, nutrient availability, soil conservation, crop protection, energy conservation, and environmental quality.

Two, determine the factors responsible for decreased crop yields during the transition from conventional chemical to organic farming systems. There is often a decrease in yields during the first 3 to 4 years after shift to organic methods.

Three, determine the long-term effects on soil productivity from the use of chemical fertilizers and pesticides. This study would include comparisons to soil for nutrients that are recycled through organic wastes and residues.

Four, develop new, improved techniques for control of weeds, insects, and plant diseases using biological nonchemical methods.

Five, determine the effectiveness of organic wastes for improving the efficiency of chemical fertilizers.

Six, study the potential impact of organic farming on the economic viability of small farms. It is believed that large numbers of small farms could change to organic farming with little impact on their own financial stability or on the U.S. economy.

Seven, implement the research recommendations of the 1978 USDA report, "Improving Soils with Organic Wastes." These include: a survey of kinds and amounts of organic wastes available now and in the future; a study of how organic wastes affect soil, tilth, and fertility; a study of the affect of organic wastes on the ability of small farms to improve soil productivity and control erosion; develop educational programs to increase public awareness of the value of recycling organic wastes in soils.

The Chair is going to recess the subcommittee to vote. There is a vote on in the House.

I would call now Dr. Terry Kinney of the USDA and Dr. Garth Youngberg of the USDA to the stand now, and if you would be prepared to resume the moment this subcommittee comes back, I would appreciate it very much.

The subcommittee is in recess for about 5 minutes.

[Recess taken.]

Mr. WEAVER. I am placing in the record at this time a copy of my opening statement.

[Mr. Weaver's opening statement follows:]

OPENING STATEMENT OF CONGRESSMAN JIM WEAVER

In February, I introduced H.R. 5618, the "Organic Farming Act of 1982" which has now been co-sponored by 21 other Members. A companion bill, S.2485, the "Innovative Farming Act of 1982," has recently been introduced by Senator Leahy.

In July 1980, the USDA released its "Report and Recommendations on Organic Farming." This study outlined significant concerns about the existing U.S. agricultural production system. According to this report, major problems confronting farmers and our agricultural system include: (1) increasing costs and uncertain availability of energy and chemical fertilizers; (2) excessive soil erosion, loss of soil organic matter, and resultant decline in soil production and tilth; (3) degradation of the environment including hazards to human and animal health from heavy pesticide use; (4) demise of the family farm and localized marketing systems. Indications are that even a partial shift to low energy agricultural systems, including the use of more organic farming techniques, would alleviate many of these problems.

At a recent oversight hearing on USDA programs, Dr. Anson Bertrand, Director of the USDA's Science and Education Administration, discussed the increasing and diverse interest in organic farming around the country. His office, which authored the USDA report, has responded to over 2000 written requests, held four regional conferences, established an Organic Farming Coordination Committee, and answered countless phone calls on this topic in the last two years.

Dr. Bertrand emphasized a number of potential benefits resulting from increased use of organic methods. These include: (1) reduced operating costs; (2) increased erosion control; (3) better environmental protection; (4) and the independence and sustainability of the production system. He felt the major obstacle to sustaining an organic farming program at this time was funding for research, the financial and entrepreneurial situation of individual farmers, and the current farm structure.

In addition, many farmers lack information on alternative agricultural systems. They are understandably hesitant to make a transition because any change entails a certain amount of economic risk. This is especially true today, with the tremendous economic pressures facing most family farmers. There is a great need for practical demonstrations and proven research to help farmers make this transition to what promises to be a more efficient, economic, and sustainable form of agriculture. My bill helps solve these problems.

H.R. 5618 requires the compilation and dissemination of existing research data on organic agriculture. Through a volunteer program, it also makes available practical advice from experienced organic farmers. It requires the Secretary of Agriculture to make these resources available at local offices of the Cooperative Extension Service.

It further establishes six pilot research programs at land grant universities throughout America. These programs would focus on improving organic farming techniques, and developing economically sound methods to help conventional farmers increase their utilization of organic agricultural practices. Research results would also be available through local extension offices.

Currently there is no legislation that addresses this vital issues. H.R. 5618 will fill this need. It will <u>inexpensively</u> provide information and carry out essential research.

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Mr. WEAVER. We are pleased to have before us two distinguished members of the U.S. Department of Agriculture, Dr. Terry Kinney, Administrator, Agricultural Research Service, and Dr. Garth Youngberg, policy and coordination staff, Science and Education Administration.

Would you proceed with your testimony, please, Dr. Kinney?

STATEMENT OF DR. TERRY B. KINNEY, ADMINISTRATOR, AGRICULTURAL RESEARCH SERVICE, U.S. DEPARTMENT OF AGRICULTURE, ACCOMPANIED BY DR. GARTH YOUNGBERG, ORGANIC FARMING COORDINATOR, POLICY AND COORDINATION STAFF, SCIENCE AND EDUCATION

Dr. KINNEY. Thank you, Mr. Chairman. It is a pleasure for us to be with you today.

I am Dr. Terry B. Kinney, Administrator of the Agricultural Research Service, representing Dr. Anson Bertrand, the Director of Science and Education, who is unable to be here due to prior commitments out of the city.

As requested by the subcommittee, I am accompanied by Dr. Garth Youngberg, the USDA Organic Farming Coordinator, and Drs. Dan Colacicco, Robert I. Papendick, and James F. Parr, who will speak to some of the technical aspects of the issue before us.

At the outset, Mr. Chairman, let me say that the Department is very cognizant of the interest expressed in the system of organic farming. There obviously are situations where the required inputs and the production outputs are such that organic farming would be the preferred method. There are other situations where the required inputs to achieve the necessary outputs are such that conventional farming is preferred. However, in many farming situations, a combination of methods can be utilized for optimal production.

Recognizing the interest and possible interrelations of the systems, the Department in 1980 issued its report and recommendations on organic farming. The report has been widely distributed in this country and has also been translated into three foreign languages. Since the issuance of that report, Dr. Youngberg in his capacity as coordinator has devoted a good portion of his time to providing liaison and information to those interested in the organic farming system.

The Department has several ongoing programs that relate to the needs of organic systems. These include projects on the effects of nitrogen fixation on crop production, the use of municipal organic wastes on croplands, the effects of soil fertility and soil tilth on the production of economic crops, the relationship of organic matter content in the soil-to-soil moisture retention and soil erosion, the use of animal manures as a source of plant nutrients, the use of crop rotation and crop management systems as a way to improve crop production efficiency, the development of pest resistant plants, biological pest control techniques, and the effects of organic matter on the growth and survival of soil-borne plant pathogens.

There have also been a few studies relating to the economic and marketing aspects of organic farming. These specific researches

have never been identified and categorized as components of organic farming research even though they benefit the organic system.

Mr. Chairman, the Department is sympathetic to the objective of H.R. 5618 which is to provide farming alternatives to producers and especially family farmers through research and educational programs. We do not, however, recommend enactment at this time. To effectively implement the features of the bill would require, at a minimum, the full authorizations provided for in the bill and could require major redirections of funding which would have an adverse effect on the Department's current research and extension programs. At a time of severe budget stringency, we must exercise management restraint in initiating new or expanding current activities.

We are aware that the objectives of H.R. 5618 relate to some of the findings of the USDA report, and as you requested, I will briefly discuss them. There are at least four general areas of direct overlap between the report's conclusions and the intent of this legislation.

One, operating costs: Organic farmers either avoid or largely exclude the use of energy intensive agrichemicals in their farming operations. As a result, these aspects of their production costs are considerably lower than those associated with conventional farming systems, which often rely heavily upon such inputs.

Although the legume-based crop rotations which are found on most organic farms do reduce the acreage available for cash crops such as corn and soybeans, the net farm income resulting from reduced input costs is quite often comparable to the net income of conventional farmers. As the costs of energy-intensive production inputs continue to rise in the future, we suspect that more and more farmers will be interested in the potential role of various organic type technologies in helping them reduce the costs of production.

Recently, for example, the organizers of the University of Nebraska's August 1981 Organic Agriculture Field Day were astonished that approximately 110 of the 150 persons who attended that event were strictly conventional farmers who were interested in how organic farming concepts and technologies might be incorporated into their farming operations as a way to help lower their production costs.

Two, erosion control: As the costs of conventional, engineering-type erosion control technologies continue to rise, certain soil erosion control benefits associated with organic farming practices may become increasingly attractive to the conventional farming community.

For example, organic farmers utilize such effective soil erosion control methods as grass, legume, and small grain crops in their crop rotation systems, thus reducing the percentage of erosion-prone raw crops in their cropping systems.

Organic farming systems also emphasize the use of green manure and cover crops, the application of animal manure and other organic materials, and tillage methods that keep crop residues and organic matter near the soil surface. These practices help reduce soil erosion and increase water infiltration.

Three, environmental protection: There is concern within the conventional agricultural community about the possible adverse effects on environmental quality caused by increased soil erosion, plant nutrient and pesticide runoff, and the leaching of these materials into underground water supplies. Various aspects of organic agriculture may offer at least partial solutions to some of these problems.

For example, improved soil physical characteristics and increased microbial activity caused by high levels of soil microbes and soil organic matter not only reduce soil erosion, they also decrease nutrient and pesticide runoff and leaching.

Potential pollution hazards caused by excessive fertilization are also minimized under organic farming fertility management which is characterized by the use of nutrient sources—animal manures, green manures, cover crops, crop rotations, et cetera—that, when properly managed, are less susceptible to loss through runoff and leaching even when applied in excessive amounts. Reduced exposure to chemical pesticides may also enhance human and animal health.

Four, independence and sustainability: Some elements of the conventional agricultural community are increasingly concerned about the long-term sustainability and security of our food and fiber production system. While decreasing soil fertility and the increasing costs of petroleum-based agrichemicals are the most frequently mentioned sources of concern, it is perhaps the uncertainty of petroleum supplies that poses the most serious potential threat, at least in the short term, to conventional methods of agricultural production.

The specter of an OPEC-type cartel in control of such vital crop nutrient sources as phosphorous and potassium is also disquieting. In this regard, the largely self-sustaining nutrient recycling systems typical of organic agriculture may offer a measure of personal independence to the American farmer while simultaneously contributing to the enhancement of soil fertility and the long-term sustainability of the American food supply.

In addition to these general areas of overlap, H.R. 5618 also addresses several of the more specific research and education recommendations of the USDA report. First, its emphasis on meeting the immediate informational needs of would-be organic farmers coincides with the report's conclusion that inadequate educational materials and programs in this area presently exist. See section 7.4, "Extension Programs," of the USDA report.

Second, the report concluded that it would be necessary to investigate total organic farming systems through the use of interdisciplinary teams using a holistic research approach. See section 7.2, "Research Recommended by USDA Study Team," of the USDA report. The pilot research projects appear to be designed with this end in view.

Third, the need for continued national planning and coordination is covered in sections 5 and 6 of H.R. 5618. See section 7.5, "Recommendations on Organization and Policy Matters," of the USDA report.

Despite these potential advantages and areas of overlap, it is clear that most American farmers, particularly in the short term,

will continue to rely heavily upon conventional methods of food and fiber production. There is a host of reasons for this, many of which are discussed in the USDA report. In general, the major obstacles to the wide-scale adoption of organic farming methods revolve around the broad issue of farm policy and farm structure, and the financial and entrepreneurial situations of individual farmers.

Mr. Chairman, to the extent resources allow us, the Department will continue to provide research and information which will benefit those farmers interested in utilizing the organic farming system, but we do not feel legislation is necessary at this time.

This concludes my prepared statement, Mr. Chairman. I and my associates will be happy to respond to any questions you might have.

Mr. WEAVER. Thank you very much, Dr. Kinney.

Before we go on to Dr. Youngberg, while your testimony is fresh, I would like to ask a few questions, and other members may also.

First of all, there is a report, in the May 30 Des Moines Register, the gist of which said this. The USDA has quietly quashed plans initiated during the Carter administration to step up research on organic farming and to encourage farmers to make more use of nonchemical techniques. The Department, on orders from Secretary Block, has ignored congressional directives to expand its organic farming effort and has told the organic program's lone employee that he can spend only half-time on organic work.

Would you comment on that, please?

Dr. KINNEY. Mr. Chairman, I am aware of no such orders or intent either from the Secretary's office or from any of the agencies of the Department. Certainly, I have not, as Administrator of Agricultural Research Service, received any such directive from the Secretary.

Mr. WEAVER. Who is the lone employee? Is there a lone employee working on organic farming right now in the USDA?

Dr. KINNEY. I suspect—and Dr. Youngberg, you may correct me—that they are referring to Dr. Youngberg's activities as coordinator.

Mr. WEAVER. Has there been a directive to Dr. Youngberg then to spend only half-time on organic farming?

Dr. KINNEY. I can let Dr. Youngberg respond to that, but I would say that there has been no such directive. Because of other priority matters, Dr. Youngberg has had to assume some responsibility for other activities.

Mr. WEAVER. I will ask Dr. Youngberg in good time. Thank you.

You mentioned in your testimony that passage of this bill would require major redirection in the funding of research. Would you explain that? What is your total research budget now?

Dr. KINNEY. Our total research budget in Agricultural Research Service is approximately $430 million.

Mr. WEAVER. Will you please tell me why a few million dollars a year spent on organic farming research would require a major redirection of funding? That was the quote I take from your testimony.

Dr. KINNEY. Yes, Mr. Chairman. Mr. Chairman, our research funding, inadequate funding for all research conducted by the Agricultural Research Service is such because of the lean years we

have been through, the fact that our budgeting increases have not kept up with increased costs. Even redirecting $1 million would be a major activity. This is because we are now in such a tight balance between the research programs we are expected to conduct and the amount of funds to support them that redirecting substantial funds would mean that we would have to curtail or close out other research in order to give additional specific input to organic farming.

Mr. WEAVER. Dr. Kinney, at present, you have a $430 million budget. I would hope that several million dollars more would be appropriated on top of that for the programs in this bill. I agree with you that we have not been generous with research as I believe we should be.

However, do you not believe, sir—and from your testimony I think perhaps you do—that we should perhaps begin to probe new directions in our agriculture, and that now is the time to do it?

Dr. KINNEY. Mr. Chairman, I think as we look ahead to the next two or three decades in agricultural production and the contributions that agricultural research is going to have to make there are many, many areas that need to be probed, perhaps including organic farming.

However, I think we need very much to be concerned about our natural resource base.

Mr. WEAVER. Dr. Kinney, on that point I agree completely. That is the point. Aren't we in desperate straits today with our loss of soil, our water being depleted, our whole agricultural base disintegrating before our very eyes. Report after report, book after book, data after data shows this to be the case. Don't you agree that we are heading toward real catastrophe? I won't necessarily characterize it in that regard, but aren't we simply heading in a direction that could be devestating to our agriculture if we continue today on this course?

Dr. KINNEY. Mr. Chairman, I do agree that there is reason for great concern about agricultural productivity in the future. I think Secretary Block has made it clear that he shares this concern. Two priorities that he has expressed concern about are productivity, and at the same time, in the same breath, he expresses concern about increased productivity while protecting our natural resource base.

I think organic farming is one possible tool for helping to protect that natural resource base. But it is not the only tool.

Mr. WEAVER. I am fully aware of that, sir. But it is one that should be explored. What made our agriculture great in my opinion was the enormous educational services of the Extension Service taking out the research that had been done in the land grant colleges and experiment stations and adopted by our farmers. Now this is what this bill is all about—to start that process in organic farming, to work in those appropriate organic methods that could be very helpful to farmers.

My final question to you is, Do you in general agree with and stand behind the 1980 report issued by the U.S. Department of Agriculture?

Dr. KINNEY. Yes, I think that that was an objective, realistic report. I think the recommendations and so forth need to be inter-

preted and implemented in keeping with the resources that are available and the host of problems that present themselves in any point in time.

Mr. WEAVER. Thank you very much.

Does the gentleman from California have any questions?

Mr. BROWN. Dr. Kinney, I want to commend you on your statement's expression of the potential importance of organic farming. I think you laid out the key reasons why this is an area which deserves attention. I am also impressed by the number of ongoing research activities which are directly pertinent to organic farming, although, as you comment, they are not included in a program that is labeled organic farming. There may be good policy reasons for doing that. I would like to explore that with you for just a moment. I have no objections to it.

Can you describe the public reaction, including the agricultural community and the agricultural chemical community, to the organic farming report? We understand that it received considerable attention and a lot of requests for copies and further information, but do you have any specific measurements of response from the important subcommunities that I have mentioned—agriculture and the chemical industry?

Dr. KINNEY. Mr. Congressman, I am aware of the profound interest that was expressed on the part of all segments of the agriculture community to the organic farming report and the fact that the Department had conducted a study.

I was not personally in a position to receive those expressions of concern or expressions of interest myself. So I am generally aware that there were many. I think Dr. Youngberg was perhaps even more personally involved in addressing those.

However, I might say in general that the interest is not surprising when one considers the tremendous increase in costs of production that have come about in the last several years. I think producers and agribusinesses in general are very much concerned about the most economical means of production. I think that if we suggested any measure that might be appropriate in reducing costs or increasing profits there would be a profound interest in it.

Mr. BROWN. We will explore that with Dr. Youngberg a little bit later. I was just interested if you were personally aware of specific reactions.

We do not have to be very sophisticated here to know that the organic farming report and discussion of organic farming is also polarizing. It disturbs some people. It disturbs conventional farmers who think that maybe it is some sort of a fad or something like that and that it may have an upsetting effect on them. It disturbs those who have developed large-scale markets for agricultural chemicals who see those markets being threatened. This is quite understandable. I am trying to evaluate the degree to which we may have a measure of how much disturbance there was in connection with this.

I personally am not interested in pursuing something merely because it is faddish or it happens to coincide with somebody's long-term concept of what is good for ecology or something like that. I think it has to demonstrate substantial and practical benefits to the farming community and the people of this country.

However, I am disturbed at the fact that there is some indication that a counter reaction against organic farming may be setting in, and I am disturbed because it may be indicative of a lack of concern for the long-term sustainability of agriculture. I think you described the importance of the recycling aspect of organic farming to the long-term sustainability of agriculture. Our entire industrial system faces a sustainability problem for failure to concern itself with some rather elementary things like resource conservation and long-term productivity, not gains but just productivity sustainability, which is one of the things we think organic farming can contribute to.

Do you know of any specific efforts that may have been made either within or without the Department to suppress or downgrade or diminish the impact of the organic farming report?

Dr. KINNEY. No, sir. I know of none.

Mr. BROWN. You are aware of the fact that that happens sometimes?

Dr. KINNEY. I am very much aware. I regard one of the important responsibilities of the Department and the agencies, is to do everything we can to minimize the devisive nature of information and to recognize that we must think about systems of production, not organic farming versus conventional farming.

Mr. BROWN. Were you aware of the efforts made to suppress the studies on organic farming made by Dr. Commoner a few years back?

Dr. KINNEY. No; I am not aware of that.

Mr. BROWN. I have no further questions.

Mr. WEAVER. Thank you.

The gentleman from South Dakota.

Mr. DASCHLE. Thank you, Mr. Chairman.

Dr. Kinney, on May 30, the Morning Register quoted the Ag Consultant magazine as reporting that Secretary Block—and this is a quote from the Ag Consultant—said, "We were assured that there be no followup by the present administration on this dead end type research." He was referring to organic farming and to the report.

I would like to know how you justify that quote with what you had told this subcommittee this morning. If this is indeed the attitude of the Secretary, that we are dealing here with dead end type research, how in the world can you come before this subcommittee and give us the testimony you just have?

Dr. KINNEY. Mr. Congressman, first of all, I am not aware of that quote, or misquote. I think this was a question that the chairman and Congressman Brown raised a short time ago.

I cannot respond to your query because I think it is incompatible with what I have said, and what I have said has been cleared with the Secretary.

Mr. DASCHLE. It certainly is incompatible, and it is incompatible I think with what the report has indicated your position to be, but it is not incompatible with the record. The record is that you oppose this legislation in theory. It is a very nominal piece of legislation, setting up six research projects. I cannot for the life of me understand, given the incredible demise we find today in productivity potential and the erosion problems we have in our country that

you can come before us, and on the basis of not having available resources, tell us that you cannot support this legislation.

I think it is very compatible with what the record states. The record shows that there is absolutely no support. This article goes on to say that Dr. Youngberg has been directed to devote only half his time to organic farming. Is that your understanding?

Dr. KINNEY. It is my understanding that Dr. Youngberg has had to take on some additional duties over and above the coordinator role of organic farming.

Mr. DASCHLE. Well, then that statement again is compatible with your actions.

Let me ask you this. What specific dollar amount can you say that your agency is not attributing to organic farming?

Dr. KINNEY. Mr. Congressman, that is a very difficult, if not impossible, figure to arrive at.

Mr. DASCHLE. You are not prepared to give us any figure? Let's not be specific then. Let's take a ball park figure. How much are you devoting to organic farming? Tell me that. How much in dollar amounts, in general terms?

Dr. KINNEY. I need to qualify this statement, because we can categorize research in many different ways on paper. We have something less than $1 million now that is specifically identified as organic farming research.

Mr. DASCHLE. What is your whole research budget? Can you tell me that?

Dr. KINNEY. Approximately, $430 million.

Mr. DASCHLE. You have $430 million in budget, and less than $1 million of that is going to organic research? Is that what you are telling this subcommittee?

Dr. KINNEY. No; that is a distortion.

Mr. DASCHLE. I guess it is.

Dr. KINNEY. When you start categorizing research—whether you call it research on production, whether it is soybean production or whatever, or if it is research on soil erosion, or if it is research on animal production.

Mr. DASCHLE. You can investigate research dollars any way you want to, but what you told me, and I will give you one more chance to clarify this, that money direcly attributable to organic research is less than $1 million. Your whole research budget is $430 million. Is that what you are telling this subcommittee?

Dr. KINNEY. Mr. Congressman, I am saying that our $430 million budget includes more than 25 percent of that. More than 25 percent of that is associated with crop production. Much of the crop production research includes research that is directly related to organic farming components.

I have to go back and say that we need to think about systems of production and not organic farming versus conventional farming.

Mr. DASCHLE. As you know, we have had an emphasis on conventional farming all along. That has been the emphasis. We have not allowed ourselves to direct any other moneys or any other attention in spite of our own reports. The summary of this report is very clear—it is in our own best interests if we take our report at face value. It is in our best interests to be pursuing organic farming in a lot more direct way than we do now.

What you are telling us is that out of $430 million we do not have $3 million for the kind of project that this legislation would allow. I think the statement in the article attributed to Mr. Block is very, very compatible with your record and with what you are telling us. What you are telling us in your statement is one thing; what you are telling us in answer to these questions is something totally different.

I find an amazing compatibility between the record and how you have answered my question.

Mr. WEAVER. Would the gentleman yield?

Mr. DASCHLE. Yes.

Mr. WEAVER. I would like to make a specific inquiry, Dr. Kinney. How much money is being expended on pest control research that allows one insect to take care of another insect, for instance, to have ladybugs eat aphids? How much of your budget is being expended on research in this regard?

Dr. KINNEY. I think the chairman is referring probably to research on biocontrol.

Mr. WEAVER. I suppose I am.

Dr. KINNEY. I do not have that figure in mind, but it would be probably several million dollars.

Mr. WEAVER. Why wouldn't you call that organic farming?

Dr. KINNEY. It is a component of organic farming.

Mr. WEAVER. But you just answered the gentleman from South Dakota by saying that less than $1 million was directed specifically to organic farming techniques.

Dr. KINNEY. Mr. Chairman, the point I was trying to make was that if we put a code number down we come up with less than $1 million. If we looked at the research that is going on in soil tilth, in soil erosion, in our irrigation work, in biocontrol, in integrated pest management, many components of that would be classified as contributing to organic farming.

I prefer to think of it as components contributing to production systems. As I said in my testimony, I think there cases that any of us who have farmed can recognize where there are situations where organic farming is the system to use. There are other cases where conventional farming for the most part is the ideal system.

However, I think any intelligent farmer uses a combination of organic and conventional farming.

Mr. WEAVER. I would like to ask you to submit, Dr. Kinney, the various specific research projects that you consider to be associated directly with organic farming techniques.

Dr. KINNEY. I will do that.

Mr. WEAVER. Without objection, the record will be held open to receive that information.

[Material supplied follows:]

The following ARS research areas contain components that have some relevancy to organic farming. Funding in fiscal year 1982 for each area of reaearch is also shown.

Research area:	*Thousands*
Horticultural crops, insect control	$8,584
Field crops, insect control	7,585
Basic insect control technology	12,768
Biocontrol and taxonomy	10,036
Disease and nematode control	9,766

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Weed control technology	11,079
Tillage practices	3,489
Water use efficiency	9,254
Soil fertility	7,866

The amount of the components that relate to organic farming varies widely between the research areas.

Mr. WEAVER. The gentleman from South Dakota?

Mr. DASCHLE. Mr. Chairman, I have no more questions.

Mr. WEAVER. I would like Dr. Youngberg to proceed with his testimony, and then we will have further questions from members.

Dr. YOUNGBERG. Mr. Chairman, I do not have a prepared statement. My understanding was that I was to be here to try and respond to questions.

Mr. WEAVER. I had a real conventional dirt farmer in my office a couple of weeks ago from Oregon. He was a berry farmer. He did not go along with any of these organic or ecology methods or anything else. He just did what he was supposed to do. However, he said he had discovered that if he held off spraying his first application of chemicals on his berries the ladybugs ate the aphids. At the end of the year, he found out he had better berries, and his chemical costs were cut in half.

I asked him how many other berry farmers were doing that, and he said he did not think anyone else was. He just discovered it on his own.

Dr. Youngberg, don't you think it is a good idea that that kind of information should get around to other farmers?

Dr. YOUNGBERG. Yes, I do.

Mr. WEAVER. What are we doing about it? Is that your function in the USDA?

Dr. YOUNGBERG. My function primarily has been aimed at trying to followup to the USDA report, which was issued in July 1980; to respond to information requests or requests for the report or requests to speak to various groups—producer groups and others—about what the Department intends to do about organic farming and what it is doing now. So there has been a great deal of activity in that area.

Mr. WEAVER. What kinds of responses have there been to the organic farming report, published in 1980?

Dr. YOUNGBERG. As alluded to previously by Dr. Kinney and I think other members of the subcommittee, there has been an outstanding response. We probably have distributed somewhere in the neighborhood of 38,000 to 39,000 copies of the report to date.

Mr. WEAVER. Were all of those requests for the report?

Dr. YOUNGBERG. These were distributed primarily, if not totally, as a result of individual requests as opposed to a mass mailing distribution.

Mr. WEAVER. So there is a great deal of interest out there in this. Is there not?

Dr. YOUNGBERG. That would be my judgment, yes. This is based upon impressions, not a systematic study, but the requests both for information and the report have come from a rather broad spectrum of farmers.

Mr. WEAVER. A broad spectrum of farmers?

Dr. YOUNGBERG. I would say that is true, yes.

Mr. WEAVER. What has the U.S. Department of Agriculture done to meet this? Have you been provided additional staff? Have you been able to broaden your information services? What has been happening there?

Dr. YOUNGBERG. I have been attempting primarily to respond to these by mysef, but I am supported by what is called the Organic Farming Coordinating Committee, which consists of 10 scientists and other technical specialists. These are people who have other jobs—full-time responsibilities in the Department—but they were anxious to be a part of a followup activity. They have done much of the followup, too, in terms of requests to speak to groups and also to try to provide information that I could not provide.

Mr. WEAVER. How often do they meet?

Dr. YOUNGBERG. We have very few full formal meetings, but a good deal of conversation through the mail and by telephone. We do interact quite frequently as a matter of fact.

Mr. WEAVER. But there is no one else besides yourself designated on the USDA staff in this area. Is that correct?

Dr. YOUNGBERG. That is correct.

Mr. WEAVER. Have you, yourself, been given additional duties now that have taken you away from some of your organic activities?

Dr. YOUNGBERG. That is correct also.

Mr. WEAVER. What are those duties?

Dr. YOUNGBERG. I am a member of the Science and Education Coordination Office. It is an office that has been attempting to support the director of science and education. That staff has been reduced considerably from its earlier size and earlier designation under SEA when it was called the program planning staff. As a result of that, given the broad range of issues that come before the director, I have been asked to devote approximately half of my time to those kinds of responsibilities.

Mr. WEAVER. Would you mind staying in the witness chairs, please, and we will be back as soon as possible. We have a vote on the floor. The subcommittee will recess for a few minutes.

[Recess taken.]

Mr. WEAVER. The subcommittee will be in session. That is the last vote for 4 hours. So we will not be disturbed, and it is the chairman's intention to go straight through with this hearing today and complete it in one spell.

Dr. Youngberg, would you tell us what your interpretation is of this widespread interest in the organic farming techniques that you have discovered in your position, and what are some of the findings or conclusions in the reports and research that could explain this interest?

Dr. YOUNGBERG. That would help explain the widespread interest in the report?

Mr. WEAVER. Yes.

Dr. YOUNGBERG. I would say that there are probably four or five items in the report—findings and conclusions—that, based on my experience, would go a long way toward explaining the response.

As you know, Mr. Chairman, there is a lot of mythology surrounding organic farming, a lot of misperceptions about not only the system itself but also those who practice it. In my judgment,

based on my travels about and the correspondence and so forth that I have had, the report essentially refuted much of that mythology.

For example, the report concluded that organic farming can indeed be practiced on a relatively large-scale farm. I think this contradicted some of the mythology surrounding the size of operation where organic farming can be practiced. In other words, we did interview farmers on farms from 600 to 800 acres and one with 1,400 acres.

Probably a second factor would be the finding that modern organic farming systems are quite different from farming systems of the 1920's and 1930's and that modern organic farmers are not regressing to an earlier or more primitive form of agriculture.

I think another finding which has caused some of this interest would the fact that there is a spectrum out there of practices and ideologies which fall within the organic spectrum of agriculture.

In other words, many people had felt that all organic farmers were purists. This is a term that is often used to describe organic farmers. We did not find that to be the case. Having completed 69 case studies, we found there were some farmers—several as a matter of fact—who will use sometimes, if need be, limited amounts of so-called conventional inputs and therefore would not qualify as ideological purists.

It seems to me that there again the finding that there is a spectrum within the organic community—a spectrum of allowable practices and so on—was quite important.

Probably the last thing that I hear the most about is the rising costs of fertilizers, in particular nitrogen fertilizer. Of the conventional farmers in particular who have shown an interest—I suppose that is the single, most important reason for that interest. Most observers realize that with natural gas prices on the increase, that nitrogen fertilizer prices could double; some estimates even say it might go higher than that within the next 3 to 4 years. This is a source of great concern to farmers, it seems to me, given the fact that this single input accounts for perhaps as much as a third or in some systems even more than that of the total variable costs of production.

In a very brief way, I would say these three or four items explain the response.

Mr. WEAVER. How widespread is the use of some of the major techniques that you have come across? I think that is the critical issue facing this subcommittee in its consideration of this bill. This is because the bill's primary goal is to disseminate whatever information we can get on workable techniques, to get it out to all the farmers. So that is the critical thing. How widespread are these techniques?

For instance, I heard about a technique to let the corn grow a couple feet high and then aerial plant the clover between the rows, in effect allowing it to fertilize the corn without any detriment from the clover itself to the corn. I understand that it increased yields and lowered costs. How widespread is that sort of technique?

Dr. YOUNGBERG. Mr. Chairman, I could not give you a precise answer as to how widespread that particular practice is.

Mr. WEAVER. In general, how widespread are techniques like that?

Dr. YOUNGBERG. I would try to answer that by saying that there is increasing interest in adopting those kinds of techniques, but I really could not give you a precise answer as to how widespread they are now. Certainly, we did discover through the study that one is talking about not just that technique as a separate technique but as an approach to farming which we would loosely call organic, probably there are 30,000 or 40,000 organic farmers in the United States today although we do not know precisely.

There again you have the spectrum problem which makes precise definitions and numbers really quite impossible. However, there does seem to be a growing interest in adopting these kinds of techniques.

Mr. WEAVER. Do you believe that more information to all our farmers would be helpful?

Dr. YOUNGBERG. Yes, I do. You may not know this, and I think Dr. Kinney may have mentioned this in his testimony, but about 110 of the 150 farmers who attended the organic agriculture field day at the University of Nebraska last summer were strictly conventional farmers. According to the organizers of that event, they came there to try to find out how these systems might be incorporated into their farming systems and how they might save some dollars.

Mr. WEAVER. The gentleman from Washington, our dear friend. I would like to say that he is a new member of this subcommittee, but a most exceptionally valuable one in that he is himself a farmer and grower and major producer of apples and other produce.

Mr. MORRISON. Thank you, Mr. Chairman. I appreciate your kind words.

I get the feeling that maybe our problem here is almost in semantics. I think organic farming as a title almost represents in the minds of some people a cult of some sort, and that the true commercial farmer, while through the years has adopted many of organic farming's techniques, and while your researchers in USDA, Dr. Kinney, are doing a tremendous volume of research that in my eyes as a commercial farmer could be categorized as organic, you do not call it that. I would refer in my own area—and this is a little bit of background, Mr. Chairman—I served for a number of years on the USDA Research Advisory Committee representing all of Northwest agriculture. So I visited many of the laboratories and am aware of the work that is done there.

As in the case of insect control that now, with the help of USDA scientists and researchers across the country and Extension Service personnel, the integrated control of pests is very much the order of the day. This is forced perhaps by economics and the high price of some pesticides, but I think it is also driven by a very basic desire on the part of commercial farmers, not organic farmers, but commercial farmers, to limit the amount of pesticides and other chemicals they use.

For instance, in one of the USDA labs, we are working on what we call the sterilized male technique for control of the coddling moth. I am sure that did not show up in your answer to Congress-

man Daschle on the investment that you were making in organic farming because you do not list it as that. However, this is a technique for controlling a very important and damaging insect without the use of any chemicals at all.

So I think that we have our terms perhaps a little confused and that makes the USDA look bad when you look at their record on organic farming research.

Let me mention another example of USDA work that is related. We subscribe on our farm to a computer service in which someone comes out every day, counts the number of mites on a leaf of an apple tree, and the computer spins back to us how many of them are friendly and how many of them are unfriendly, which mite is going to eat which other mite. When we get a concentration of a type that will lead to commercial damage, then is the only time we might consider applying an insecticide.

In some cases, we decide from that report, which was worked out with the help of USDA researchers, whether we can take the limited amount of commercial damage that will be done because the good guys are building in population fast enough to control the others.

The other thing that USDA research has helped us do recently is the organization of pest control districts. When you do have to apply a pesticide, you do it on a controlled timing basis so that all the neighbors are applying the same material at the same time, and thus eliminating the need for a number of applications.

I guess I should get down to a question. I personally think that maybe as much as 50 percent of the work that USDA is doing in research, at least in my type of agriculture—tree fruits and grapes and some of the specialty crops—is actually aimed in this direction of reducing the amount of chemical fertilizers and pesticides that have to be used in the production of a commercial crop. We just are not calling it organic farming.

Would both of you react to my statement?

Mr. KINNEY. I might make a comment first of all. Yes, I agree with what you are saying. I do not know if it would be 50 percent or what the percentage would be, but I am not sure that that is absolutely relevant. I would like to reinforce what you said by pointing out another case from the Pacific Northwest, the Palouse region, a very fragile area but good wheat country if properly managed.

The technology that is used there is through cooperation with USDA, the State experiment stations, the Extension Service, and the farmers, working in a system that is a highly effective but a unique system of cooperation between research, Extension, and the production unit.

They are using practices that one could call conventional farming or one could call organic farming to control soil erosion, to maximize yields to effect quality and so forth.

So again I come back to what I said earlier. In my opinion we need to think about systems of research and not ignore the tremendous contributions that can be made by organic farming practices. However, these should not be addressed as organic farming versus conventional farming.

Mr. MORRISON. Thank you.

Dr. Youngberg, did you have a reaction to my question?

Dr. YOUNGBERG. I agree that it certainly should not be addressed as one form of agriculture versus another. I certainly agree with that.

I guess I would just offer this as a thought to you, Mr. Conqressman. Techniques such as sterile males and so forth are fine. That is excellent. I would certainly support that 100 percent. However, sometimes these kinds of techniques are utilized as one component of an otherwise conventional system. What we learned in the report is that organic farming is a total system, involving crop rotation, fertility, and a total management approach which is somewhat different than applying individual techniques.

Mr. MORRISON. I guess I am making more statements than I am asking questions. I do see the opportunity for a better distribution of materials or information on some of the concepts of organic farming. That is the goal of this bill. I think we should look very carefully at the possibility of expanding this sort of material in that it can help us as we move both with the organic farmer and with the commercial farmer who has the desire to use fewer of these materials, and it will happen primarily because of costs.

Mr. WEAVER. If the gentleman will yield, I could not more completely concur and agree with you. What is at issue here is that we are coming out of an era where we used chemical and mechanical means to grow our crops, and it is going to be with us for many, many years. It is going to be very useful and help us grow.

The question is, now that other means are emerging, are we getting adequate research in these other means, and are we getting adequate dissemination of the information on that research? That really is the issue here.

The gentleman from California?

Mr. BROWN. I think we are seeing the emergence of the key issues here. They are well expressed by the chairman.

Let me ask you this, Dr. Youngberg. One of the major recommendations of the organic farming report dealt with the development of information materials for the county Extension offices and agents to assist them in providing this information flow on farming systems, including organic farming components. I would like to ask you whether or not you have any reason to feel that there is not an adequate program of information—and I am talking about research and management information—with regard to organic systems that is available through the system. I do not think we are trying to set up a new system, but add to that system the types of information needed to understand and effectively utilize organic farming techniques.

Is there an adequate amount or has there been an effort to curtail the flow of information related to organic farming systems through the normal channels of Extension?

Dr. YOUNGBERG. I guess one of my clearest impressions after 2 years of trying to follow up to interest in the USDA report is that apparently there is a lack of available information on organic farming systems to farmers who are interested in adopting these techniques.

As a matter of fact, my impression is so clear in that regard that we have moved forward with acquiring some private funding to

begin to inventory and assess existing Extension materials and other reports that may relate to the needs of contemporary organic farmers, but which in some cases may be out of print or unavailable for other reasons. We are beginning that project just about right now.

So we have the impression that there is a gap there in our knowledge, and that it needs to be addressed.

Mr. BROWN. I have no real desire to focus attention on it, where focusing that attention draws a lot of opposition. I would be satisfied if there was a reasonable, sustained effort to upgrade the data base and to make it available through the regular channels. However, I would like to be assured that it is taking place, and I am a little queasy when I see some of these articles about an effort being made to curtail that kind of activity. If we could find any evidence that that was the case, I think we would want to make a point about it.

Let me follow that up with a question that I asked Dr. Kinney. If I were to ask you to go through your files of responses to the organic farming report, do you think you could dig up or give us at least a rough idea of the kind of favorable response you got versus the kind of response that says this is a bunch of balogney and you should be saving your money and we object to it? Would you be able to provide this subcommittee with that kind of information?

Dr. YOUNGBERG. I would be glad to.

Mr. BROWN. I wonder if the chairman would object if we asked for that for the record. We would like to have you provide us with that information. I do not want you to spend a tremendous amount of time, but we would like a reasonable summary of the kind of pro and con response that you received.

Mr. WEAVER. Without objection, the record will be held open to receive that information.

[Material supplied follows:]

U.S. DEPARTMENT OF AGRICULTURE,
SCIENCE AND EDUCATION PROGRAM STAFF,
SCIENCE AND EDUCATION COORDINATION OFFICE,
Beltsville, Md., June 18, 1982.

Hon. JAMES WEAVER,
Chairman, Subcommittee on Forests, Family Farms, and Energy, House Agriculture Committee, House of Representatives, Washington, D.C.

DEAR CONGRESSMAN WEAVER: This is in response to a question raised by the Honorable George E. Brown during the June 10 Hearing on H.R. 5618, "The Organic Farming Act of 1982," which was conducted by the House Agriculture Subcommittee on Forests, Family Farms, and Energy. Congressman Brown requested that I provide information to the Committee regarding the relative proportion of positive and negative responses to the July 1980, USDA Report and Recommendations on Organic Farming.

The following information accurately reflects pro and con responses to the Report of which I am personally aware. These proportions are not, of course, necessarily reflective of the total universe of responses or reactions to the Report.

Letters—Over all, I have received approximately 2,000 letters relating to the Report. Of these, all but three were positive.

Telephone Calls—While it is impossible to provide a precise estimate of the number of telephone calls that were generated by the Report, it certainly would be no exaggeration to say that I have received hundreds of calls. All of these calls have been positive.

Press Coverage—My file of press accounts, includng editorials, reveals that virtually all accounts have been positive. I am personally aware of no more than 3 to 5 negative editorial or press accounts.

Sincerely,

I. GARTH YOUNGBERG,
Program Coodinator.

Mr. BROWN. Are you aware of an effort by the farming or chemical industry to suppress information or to decrease funding for research in organic farming?

Dr. YOUNGBERG. I am not aware of any such effort.

Mr. BROWN. You are not aware of a widely reported incident in which the funding for, I think, St. Louis University was cut off by a chemical company because they were reporting the research by Dr. Commoner on organic farming?

Dr. YOUNGBERG. I recall reports to that effect. I thought you were referring to our effort within the Department.

Mr. BROWN. I am referring in general to the industrial response to an emphasis on organic farming. You do recall that incident?

Dr. YOUNGBERG. Yes.

Mr. BROWN. And it is not a single incident; there are other incidents of that sort. I would say that the chemical industry is acting in an unenlightened fashion when they do that, and hopefully they will get more enlightened as we go along here. It is in their own best interest to do so.

I have no further questions.

Mr. WEAVER. I want to thank the gentleman from California, who is the chairman of the senior subcommittee of the full Committee on Agriculture, which also has jurisdiction over this bill, and with full jurisdiction over the research programs of the U.S. Department of Agriculture. In his wisdom, I think his comments show exactly what the situation is, and I agree completely that if it becomes a fight of one word versus another—chemical versus organic—nobody is going to be helped. We simply have to develop the techniques that work.

I still have a feeling that there are elements out there that would suppress this information. I can assure you that the people I know in organic farming have very little means to suppress information on chemical farming, but the chemical industry can exert some of its influence on organic farming.

I would like to ask one final question of Dr. Kinney. We know that we have one person part-time on the staff of the USDA for answering inquiries into organic farming techniques. How many specialists or scientists do you have on your staff in the chemical field?

Dr. KINNEY. Scientists who are working specifically in——

Mr. WEAVER. In the chemical field—insecticides, pesticides, et cetera.

Dr. KINNEY. I would say a couple hundred.

Mr. WEAVER. A couple hundred?

Dr. KINNEY. Yes.

Mr. WEAVER. I do not think I have to say anything more.

Are there further questions of these two witnesses?

[No response.]

Mr. WEAVER. Well, thank you very much. We appreciate it.

The Chair will go out of order to call Mr. Neil Sampson who must leave by noon. If Mr. Sampson would come up and present his testimony, we would appreciate it.

STATEMENT OF NEIL SAMPSON, EXECUTIVE VICE PRESIDENT, NATIONAL ASSOCIATION OF CONSERVATION DISTRICTS, WASHINGTON, D.C.

Mr. SAMPSON. I appreciate the opportunity to do this. I unavoidably must leave.

I would like to just briefly touch on the testimony today and enter my full testimony as submitted for the record if I might.

Mr. WEAVER. Without objection, a copy of your prepared testimony will be placed in the record at this point.

[The prepared statement of Mr. Sampson appears in the appendix.]

Mr. SAMPSON. Our conservation districts—about 3,000 of them—are served by about 17,000 conservation district officials, of whom we think about 85 or 90 percent are farmers. I would suspect that in the main, although there are some outstanding exceptions, these people would not be considered organic farmers but rather conventional farmers.

However, they are conventional farmers who are concerned. They are concerned about soil and water conservation. They are concerned about resource use, and they are concerned like every farmer about productivity and profitability and staying in business from 1 year to the next.

Many of them still use the conservation methods that are sort of classical—crop rotations—and some that are pretty new and not so classical—conservation tillage clear up to no till. Virtually everyone of them is on the lookout for any method, new, old or in the middle, that can make both economic sense and help them to improve the soil and water conservation system at the same time that they are improving productivity.

Organic farmers working as I see it with the latest in innovation and information can be one of the real sources of information that our people can look to. Obviously in the area of soil conservation every study that has looked at organic farmers has discovered that they do quite well. That is not any surprise, because the methods they use are highly compatible with opening up soils to infiltration and preventing soil erosion.

But there are a lot of unknown questions, too. They have been gone over here today and will be gone over at some length. So it seems to me that it is critical to take a look at the things we do not know. We find in the soil conservation business, and I think it is the same in any kind of farming business, that what is not known is often very localized in nature. The questions that people ask are what can I do on my place with my situation, and that speaks for this very widespread information dissemination and information sharing system that we have with the Extension system, with the conservation district system, and the other agricultural systems in this country.

So in that regard, it seems to me that your bill is conceptually very well aimed, to try to get the cross transmission of information between the people who know and the people who need to know.

Let me make a couple of observations about the bill itself. It would establish a system of volunteers. Let me only bring to your attention the fact that in the farm bill of 1981 you authorized USDA to use volunteers, and you provided the kind of protection under the Tort Claims Act that is necessary for USDA agencies to have a volunteer on the scene. That authorization now exists. Whether USDA wants to use it on this particular activity or not is a complete other question. However, the authorization exists and was in the 1981 farm bill. So you might push that way.

I also want to point out that there is a danger in trying to do too much with volunteers. If volunteers are seen as somebody in addition to or doing something that is different from what the professionals in the USDA at the field level are trying to accomplish, that sort of relationship will not be constructive. Any move to disseminate information on any kind of farming system, whether it is organic farming or conservation farming or whatever you want, has to have some acceptance, it seems to me, within the organization itself. That may be a while in coming, and it is going to take a lot of leadership from Washington.

Finally, we have pointed out that there is a tremendous organic waste problem in this country. It is usually associated with urban America. The methodologies of using that as a resource in agriculture rather than just as a nuisance in urban America largely lie with the people who are already dealing with organic farming techniques. They are going to be the people who are going to be the most amenable, it seems to me, to learning how to use this interaction between organic waste problems in urban America and farming systems.

I would hope that if we can start USDA doing a little more along that line we would do everything possible.

I would like to conclude with one observation if I might as to the research question the subcommittee was discussing with the previous witnesses. It seems to me that we have to talk about the difference between privately funded research and publicly funded research. This morning we have talked about priorities, and you made the point about whether priorities have apparently lain judging from staff and so forth.

In both conservation research, which I deal with more, and the research you are talking about today, we have the frustrating problem that many of the methods and products or procedures involved do not involve salable products. Therefore, they are not attractive for commercial research. On the other hand, we all know that there is a great deal in agriculture today that does in fact offer good commercial possibilities and that the research on those products is widely done in the private community.

It seems to me that when we are talking tight budgets, a very difficult situation in funding research, is such a useful distinction to make, and USDA's research priorities would do well to look at the gaps in our total agricultural research picture. Those gaps largely lie where there is very little commercial sale possibility and where commercial interests logically are not going to enter.

I think if we would look at that from here in light of the topic that we are talking about today such things as the integrated pest management that the Congressman from Washington was so adequately explaining and other things would get a lot more priority, as I think they have been in USDA over the past few years. However, I think this is a thing we need to accelerate.

I appreciate the chance to testify, Mr. Chairman.

Mr. WEAVER. Mr. Sampson, your two major points have been extremely helpful. I think you elucidated on the issue beautifully. The problem of urban waste is certainly a sore point for so many of us in cities. I know we have a flaming controversy going on now in my town of Eugene, Oreg., with the new sewage plant and the farmers being asked to take the residues from it. But they are refusing because of the poisonous metals in it, and then the city cannot do anything with it. We are going to have to come up with something on that, and I have no idea whether any research is being done. However, this would be an area to do it in.

Second is the fact that many of these techniques that fall within this area of so-called organic farming do not have commercial sponsors through no fault of anybody. Therefore, it is in the public interest that the Government undertake both the testing and the dissemination of information.

These two points are most valuable, and I appreciate your coming and making them.

We would like the opportunity for other members to question you. Are there questions by any members of the subcommittee?

[No response.]

Mr. WEAVER. Thank you very much, Mr. Sampson.

Mr. SAMPSON. Thank you, Mr. Chairman.

Mr. WEAVER. The Chair will now call the three remaining witnesses from the U.S. Department of Agriculture, Dr. Daniel Colacicco, Dr. James F. Parr, and Dr. Robert Papendick. Do you have prepared testimony?

Dr. COLACIOCCO. No.

Dr. PARR. No.

Dr. PAPENDICK. No.

Mr. WEAVER. You do not. I appreciate you coming. Would you each identify yourselves? I was starting with Dr. Colacicco.

Dr. COLACICCO. My name is Daniel Colacicco. I am an economist with the Economic Research Service, involved mainly with research on utilization of urban waste on agricultural land. I got involved with the organic farming report as an economist interested in looking at resource intensities and availabilities. I have been mainly concerned with the energy productivity of organic farming.

Mr. WEAVER. Are you here in Washington, D.C., sir?

Dr. COLACICCO. Beltsville, Md.

Mr. WEAVER. Dr. Parr?

Dr. PARR. I am Chief of the Biological Waste Management Laboratory at Beltsville. One of our activities is the processing and composting of sewage sludge for land application in agricultural use. I certainly would be glad to send you that information. A great deal of research has been done on utilizing sewage wastes as well as sludges for increasing agricultural productivity. This work has been going on for about 8 or 9 years.

I have been in my present position since 1975. I find myself being loaned out to the United Nations on occasion for consultation to developing countries on organic recycling and waste management problems.

I also worked on the organic farming report with these other gentlemen and also Dr. Youngberg.

Mr. WEAVER. Thank you.

Dr. Papendick?

Dr. PAPENDICK. My name is Robert Papendick. I am a soil scientist in Pullman, Wash., at Washington State University. I have been there about 17 years. My main responsibility there is research on soil erosion.

I was the chairman of this study team that conducted the USDA study on organic farming.

Mr. WEAVER. Very good. I am pleased to have three such outstanding people appearing here, as were of course the two previous witnesses from USDA.

Dr. Colacicco, I understand that you wrote the section in the USDA report that dealt with the energy productivity of organic farming systems. Would you summarize and update the results of your work and perhaps discuss the energy use of organic farmers as compared to other farmers?

STATEMENT OF DR. DANIEL COLACICCO, ECONOMIST, ECONOMIC RESEARCH SERVICE, U.S. DEPARTMENT OF AGRICULTURE

Dr. COLACICCO. Yes; I will be relatively brief, just going over the major points and leave most of the statistics and data in the report where they are available.

Our data and the data from the literature have shown that organic farmers used significantly less energy for most crops than nonorganic farmers, sometimes called conventional farmers. The savings in some cases are up to 55 percent of energy per bushel of crop. This has been noted in the study in comparing conventional to organic systems.

The substitution of organic wastes and legumes in rotation, like an alfalfa, corn, and small grain rotation, for nitrogen fertilizers, is responsible for most of the energy savings.

However, limitations on this substitution of organic wastes and legumes for synthetic nitrogen fertilizers do exist. There is a limitation in the availability of organic wastes.

Myself and Dr. Parr were also part of another study team examining the availability and feasibility of using organic wastes on agricultural lands. If all the organic wastes the study team deemed to be likely to be used on agriculture land were used—likely means feasible—that would substitute only for about 6 percent of the current consumption of synthetic nitrogen fertilizers.

If we used all the organic wastes that were not currently used on land, we would substitute for only about 20 percent of the synthetic nitrogenous fertilizers.

Organic wastes do not act in the soil like synthetic nitrogen fertilizers. Organic wastes have a high concentration of organic materials. You get water-holding capacity, drought resistance, and greater infiltration. So you get a different yield response and these

substitution figures I mentioned must be considered as rough estimates.

Another limitation on the energy efficiency of organic farming is the fact that spreading wastes on land requires more fuel than spreading organic fertilizer. The extra cultivations required for weed control also increase the usage of fuel. Organic farming systems that we looked at and data that other researchers found showed that organic farming systems generally do use more fuel.

We also found that the energy productivity of organic farming systems is hampered by generally lower yields. Organic farming systems, according to the data we reviewed, consume much, much less energy per acre, but the savings per unit of output is reduced by the lower yields. As a byproduct of lowered yield, the energy productivity of organic farming is significantly increased during poor growing years. Some of the studies we looked at covered droughts and organic farmers had a tremendous edge in energy productivity because their yields were not as reduced relative to conventional farmers. In some cases in drought years, their yields were actually higher than the yields of conventional farmers.

So in conclusion, organic farmers definitely have an overall savings. Those energy savings come from not using synthetic nitrogen fertilizers derived from natural gas. However, they do use more fuel because they make more trips over the fields, which requires more petroleum-based products.

Mr. WEAVER. Thank you very much.

I am going to proceed to each witness, and then we can have general questioning.

Dr. Parr, would you give us a rundown on your activities and your part in the 1980 report, in much the same way that Dr. Colacicco has done?

STATEMENT OF DR. JAMES F. PARR, CHIEF, BIOLOGICAL WASTE MANAGEMENT AND ORGANIC RESOURCES, AGRICULTURAL RESEARCH SERVICE, U.S. DEPARTMENT OF AGRICULTURE

Mr. PARR. Yes. I conducted a number of interviews of organic farmers across the country, the same as these gentlemen did. I participated in the writing of a number of sections, one addressing the organic farming activities abroad in other countries. I spent some time with the Japanese Organic Farming Research Institute. All four of us also went to Europe to look at organic systems there.

Mr. Chairman, I would say that Dr. Youngberg addressed the impact of the organic farming report in the United States, and I think it has had a tremendous impact on developing countries.

Back in the early 1960's, we heard a lot about the "Green Revolution." Dr. Borlaug won a Nobel Prize for that work. He developed high-yielding varieties of wheat and also some rice varieties were developed that responded greatly to high levels of chemicals.

In developing countries then, fertilizers were available. They were reasonably priced. So what happened in developing countries is they got away from recycling of organic wastes to maintain and improve the productivity of their soils. This was of great concern, especially in 1972 when we had our first energy crisis. In 1973, the World Food Conference in Rome passed an urgent resolution for

FAO—Food and Agriculture Organization—to do what they could to reintroduce the idea of organic recycling and organic farming—sustainable systems of farming—in developing countries.

This is an area that I have been working in. So I find myself traveling quite a bit to the Third World. They are greatly in need of updated information on self-sustaining systems of farming. You would think that they would do a real good job of recycling their waste products, but in most cases they are not.

One thing that interested me in the bill was the research centers. Certainly I think this would be of benefit to people in developing countries when they came to the United States to get training.

Mr. WEAVER. Why aren't they doing a good job of using their wastes? It strikes me that with the low labor costs that I assume they would have and the now-high costs of some of the chemicals they would automatically do this. Economics would have them do this. What is the problem?

Dr. PARR. They are starting to change now, but in a country like India, traditionally and socially they have not been at all in favor of recycling human wastes.

Mr. WEAVER. In other words, they never have.

Dr. PARR. No; but just to the north in China, of course, it has been very fashionable and very acceptable. This is changing, but they really have not developed good systems of managing these wastes and collecting them and processing them. I think this is where the effort has to focus.

So they were most interested in the report from USDA, and I see it a lot when I go to these countries.

Mr. WEAVER. Dr. Papendick, would you do the same? Tell us what your subject has been and what information you have developed.

STATEMENT OF DR. ROBERT PAPENDICK, LAND MANAGEMENT AND WATER CONSERVATION RESEARCH UNIT, AGRICULTURAL RESEARCH SERVICE, U.S. DEPARTMENT OF AGRICULTURE, PULLMAN, WASH.

Mr. PAPENDICK. Yes, Mr. Chairman. As I indicated, my major overall responsibility was chairing the study team. So I had major responsibilities for the overall development of the report.

However, with that, I made a number of visits myself to organic farmers in Nebraska, in South Dakota, in Oregon, and in Washington. In fact I interviewed, 19 organic farmers.

My main responsibility in the report writing was in the area of erosion control and environmental pollution—the impact of organic farming on erosion control, environmental pollution, and that sort of subject matter area.

What we basically found in our study of organic farming is that organic farmers—the ones who we interviewed and became familiar with—were doing a very good job of controlling soil erosion, many well within acceptable limits compared to their conventional neighbors. There were several reasons why they were achieving a good level of erosion control.

No. 1 is that most of these farmers were growing between 20 to 40 percent of their acreage in a sod crop such as grass or legume.

They also would grow more small grains as a rule than their conventional neighbors who were pretty much into row cropping. We know from research that as you go more and more into row cropping the potential for erosion increases drastically, especially with conventional tillage systems.

In fact, with 20 to 40 percent of the acreage in a meadow crop, your erosion will be reduced to one-eighth to one-third as much as it would be with a conventional system of continuous row cropping.

The second thing we found was that many of these farmers were using cover crops during the interim between major crops. This in itself is a very strong deterrent to erosion. These crops protect the soil against rain drop impact and runoff.

The third thing that we found was that many of these farmers had shifted away from the use of the moldboard plow—that is, clean cultivation—and had gone to tillage such as disking and chisel plowing, which leaves most of the crop residues on or near the surface of the soil. We have research that shows that with these techniques you can reduce erosion by 20 to 75 percent of what it would be with moldboard plowing. Some of the conventional farmers are shifting, too, to conservation tillage systems, but many of them are still using the older technique of moldboard plowing.

A fourth reason that we found erosion was being curtailed or reduced with organic techniques is their management of the soil organic matter. Many of the practices they were using promotes either organic matter buildup in soil or reduces the decline of organic matter. We know that the use of meadow crops in the rotation slows the decline of organic matter, or in some cases it may actually build it, or return the equilibrium level to higher values.

This goes along with green manures and also application of organic materials to the soil. We heard some of the speakers here address the fact that organic farmers do stress applying organic materials to soil. We know that organic matter stabilizes soil against erosion. It holds it together, resists rain drop impact and resists runoff. The rule of thumb goes something like this: For each percentage point that you increase the organic matter in soil, say from 2 to 3 percent, it will reduce erosion about 10 percent.

As far as environmental pollution per se is concerned, again this follows from erosion control. We know that about 80 percent of the pollution of our surface waters is from sediments being carried off by erosion into our waterways. Automatically, if we can slow down erosion, we are going to get less pollution.

Another thing is that sediment carries phosphorous nitrogen, and also certain pesticides can be strongly absorbed. So any reduction in erosion is going to add to less pollution.

The second thing in pollution control is nutrient pollution. We have a number of instances now that we know where we are getting pollution from nutrients being applied as chemical fertilizers; they are getting into aquifers; they are getting into surface waters. The fact that organic farming is very conservative in the use of chemical fertilizers gives them another degree of pollution control. The kinds of materials that they use—organic materials, manures, processing wastes, things like that—are less subject to leaching. They do not infiltrate the soil and percolate down.

Another thing I mentioned is they use cover crops. Cover crops tend to retain nutrients and hold them from leaching. Deep-rooted crops like alfalfa which they make very much use of are scavenger type plants. They bring up nutrients and holds them from getting down deep and getting into ground water.

The third and the last major area where organic farmers contribute to pollution control would be in the area of pesticide pollution. There is also some fairly good evidence now that we have cases of pesticides getting into surface waters where they are used or misued probably more than anything. They are either carried off in runoff or in aerial drift.

By virture of the fact that organic farmers do not use these chemicals or only use them in very conservative amounts gives them an element of protection against pollution from these materials.

Mr. WEAVER. Thank you very much, Dr. Papendick. I understand there are some wheat farmers in eastern Washington who practice so-called organic farming. Do you know of them?

Dr. PAPENDICK. There is one in particular whom we included on the organic farming study. He farms about 800 acres near Spokane, Wash. He has been doing this—well, his father purchased the land in 1910, and the farmer is now about 70 some years old, and he is retiring. However, his son is picking up the operation.

Mr. WEAVER. How do his techniques differ from regular wheat farming?

Dr. PAPENDICK. He does not use any chemical fertilizers and only a very small amount of pesticides.

Mr. WEAVER. What does he replace them with?

Dr. PAPENDICK. He grows green manure crops, for example Austrian winter peas as a source of nitrogen.

Mr. WEAVER. This is a country that I know quite a bit about myself. In eastern Oregon, they have always grown peas, every other year summer fallow. That does not sound any different. I mean most farmers I know, or at least used to when I was in eastern Oregon a lot, all grew peas every other year.

Dr. PAPENDICK. They grew it for grain?

Mr. WEAVER. Peas.

Dr. PAPENDICK. But this farmer grows Austrian winter peas for a green manure crop about once in 6 years. We made a detailed study of his farm, and as far as we can determine that is his sole source of nitrogen. His crop yields are something like 5 percent less—his wheat yields are about 5 percent less—than the neighbors.

Mr. WEAVER. His costs would be considerably less.

Dr. PAPENDICK. His costs are considerably less.

Mr. WEAVER. Why aren't other farmers doing that?

Dr. PAPENDICK. I really cannot explain that.

Mr. WEAVER. Do they have the information on it? Is the information on this farmer's techniques being disseminated?

Dr. PAPENDICK. No; they are not. We have just completed a rather detailed study of his farming operation, and I know of no other study. It has just been completed about a week ago. It was in terms of a master's thesis of a graduate student. The purpose of the study was to try to understand his operation and what it was doing

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to the soil in terms of nutrient depletion, erosion, and things like that.

Mr. WEAVER. We should make other farmers aware of this. They do not necessarily have to do it, but they should be aware of it. Should they not?

Dr. PAPENDICK. I think so, sir.

Mr. WEAVER. Wouldn't that be a very valuable function of the government, to make other farmers aware of this information?

Dr. PAPENDICK. I think this would be extremely valuable information. Many farmers in the area are very much interested in his techniques and what they are doing to the long-term productivity of the soil.

Mr. WEAVER. How widespread is the information—I will ask this of Dr. Colacicco and Dr. Parr now—you have developed in this country? Dr. Colacicco, is the information you have developed being widely disseminated?

Dr. COLACICCO. Much of the information we gathered and produced is mainly for use by the research community, and I would not say it has been tremendously disseminated.

Mr. WEAVER. It does not go out to the farmers themselves right now.

Dr. COLACICCO. I would say not.

Mr. WEAVER. Again, I tell my colleagues on the subcommittee that the issue in this bill before us is to disseminate the information as it is developed to farmers so that they have the opportunity anyway of considering various techniques as options. That is what we are trying to do here, to give the farmers various alternatives.

Does the gentleman from California have questions?

Mr. BROWN. Dr. Colacicco, I would like to conceptualize a little bit better the impact that the potential energy savings in agriculture may have. Let's assume we have a scenario in which increasing numbers of farmers resort to organic methods and reduce their energy use. If half the farmers were using the best practices for conserving energy in this fashion, what would be the overall impact on the Nation's energy use, roughly speaking?

Dr. COLACICCO. I would be very apprehensive to answer what we call a macro question like that, because there are a lot of interdependencies if a lot of farmers start doing the same thing at the same time.

However, the energy embodied in the natural gas used to produce nitrogen fertilizers consumes about a third of the total energy budget of agriculture production. By using organic methods you eliminate much of the need for synthetic nitrogen fertilizers. There definitely will be a significant reduction in the use of energy.

Mr. MARLENEE. Would the gentleman yield on that?

Mr. BROWN. Certainly.

Mr. MARLENEE. As far as using organic wastes, you are not utilizing a lot of energy. When you talk about organic farming, most of the energy use comes from the use of the fuels in equipment operation. Is that not correct? As far as using organic wastes, the biggest replacement for nitrogen is in the use of legumes. Is that not correct?

Dr. COLACICCO. I do not know the proportion of nitrogen organic farmers get from using organic wastes relative to legumes, but both are extremely important.

Mr. MARLENEE. You are not being clear.

Dr. COLACICCO. I understand what you are asking me is, looking at the nitrogen budget of organic farmers, what portion of that nitrogen comes from organic wastes, and what portion of that comes from legumes.

Mr. MARLENEE. Yes.

Dr. COLACICCO. I am saying that I do not know, but they are both very significant.

Mr. MARLENEE. I thank the gentleman for yielding.

Mr. BROWN. Dr. Papendick, I think, indicated in the case of that wheat farmer there was practically all legumes, and not much in the way of organic wastes. Other farming situations would say a corn and cattle operation might pose a different situation, and there would be more organic wastes.

Dr. COLACICCO. If we had an increase in organic farming, I think then definitely most of the nitrogen would have to come from the legumes, because as I said, organic wastes are not available for a tremendous increase.

Mr. BROWN. I am just trying to conceptualize, and I am not doing it very well, what the impact of this would be on our national energy budget. I have a rough idea how much agriculture uses. I am trying to see if this would be substantial enough to reduce the amount of imported fossil fuels that the country requires. I assume that at a certain level organic farming practice in agriculture would have some reasonable impact on our need to import energy. Would you confirm that or not?

Dr. COLACICCO. I would say that is probably true.

Mr. BROWN. With regard to this matter of the use of organic practices in underdeveloped countries, as you described the situation, I was thinking of the Agriculture Committee's trips to China in which we have noted the extensive use of animal wastes, including human wastes, and the impact that has. I understand the problem in India, that they are not using animal wastes on a comparable scale, may be due to the fact that a lot of animal wastes are used for fuel instead of for agriculture. Is that correct?

Dr. PARR. Yes, Congressman, this is correct. I think China is quite an exception as far as developing countries are concerned. Most people who have traveled there agree that they are doing quite a good job of recycling, of mixing with sediment, packing it back up on the land, lots of labor, and the waste of one animal being used as feed for an other.

Certainly in India much of the animal waste is still burned, and what is left over probably goes into their biogas generators which they are increasing the development of. Certainly there is great interest in recycling and managing these wastes properly because of the high cost and uncertain availability of fertilizers. For example, of the three largest imports in India, No. 1, would be petroleum, No. 2, would be fertilizers, and No. 3, would be cooking oil.

Mr. BROWN. Has the Department of Agriculture or anyone else as far as you know done any extensive research studies on the economics and ecological characteristics of Chinese farming systems?

Dr. PARR. There have not been indepth reports that I know of. The reports that come to mind are the ones that the study team sponsored by the United Nations have done on biogas, aquaculture, and azolla a fern that represents part of the nitrogen-fixing ferns in rice paddies. China now is building some large fertilizer plants. It will be interesting to see whether they still develop a practical and workable balance between organic recycling and chemical fertilizers.

Mr. BROWN. I was going to raise that point next. It is obvious that the Chinese are seeking to import Western technologies used in their agriculture. To fertilize their plants, you described, they are importing U.S. farm machinery. They are doing a number of things that indicate their interest in moving toward a more conventional type of farming. The question, as you indicate, is what balance will they achieve between the conventional system and the traditional system that they have been using for thousands of years.

Dr. PARR. Yes; and really what we sought to do in the organic farming report is strongly recommend that we also seek a practical and workable balance between chemical fertilizers and organic materials.

I would say this, too, Congressman. I think of the larger scale organic farmers who we visited most of the nitrogen is coming from the sod base rotation and the legumes that are being grown. A few of those large organic farms were importing paunch manure from say the city of Omaha and composting it.

I think as municipal wastes are managed more properly and composted, assuming that the heavy metal contamination is very low, for example, the industrial discharge into that particular sewage system is very low, these wastes are most valuable resources for agriculture. I think you are going to see small farms that do not have animal units to provide manure—the 40-acre farmer, the 25-acre berry farmers, something like that—they are going to utilize these processed and composted municipal wastes. They must import, because they do not have any other way of doing it. They are farming very intensively berries, tree fruits, potatoes, vegetables, and so on. So I think you are going to see, at least this was the conclusion of the Small Farm Symposium a few months ago at Beltsville, particularly around the periphery of large municipalities that if these processed organic materials were available—sewage wastes, municipal wastes, and so on—you would see a ready market for them on small farms.

Mr. BROWN. Let me ask you just one additional question, and any of you can respond to this. It seems to me that part of the problem here in adopting organic methods versus conventional methods or proper balance between them, which is what I think we are really trying to do, may lie in some of the system problems of economic analysis in which the economic models that we use tend to favor short term, high yield, high profitability operations rather than long term, stable, sustainable conserving operations.

For example, I do not know of any economic model applied to agriculture which would internalize the costs reflected by underground water table contamination or stream contamination or the

cost 30 years from now of the erosion impact. I just do not think the system accommodates that very well.

I ask you to comment as to whether that is your feeling, or if I am incorrect.

Dr. PARR. I agree. There are social costs of intensive crop production, and we know what they are—environmental pollution, erosion, contamination of surface waters and even ground waters, pesticides getting into drinking water, nitrates in drinking water.

Mr. BROWN. Those become social costs which the taxpayer in general bears, and so it does not enter into the calculus of the farmer himself.

Dr. PARR. Yes, and there is reason to believe that in this intensive production agriculture, cash grain production, there may be quite a contribution to that particular cost. If the social costs of production were ever assessed, I think the price of food and commodities would go up quite rapidly.

Mr. BROWN. Would that be an area of research which might be productive if we could have some more indepth economic studies of how to internalize these social costs and have them enter into the overall accounting of farm profitability? Just as we try and do for industrial plants, for example, it is becoming very popular to have them recognize the costs of social evils that they produce.

Dr. PARR. I would say yes. There is certainly an interest in this. I think that Governor Ray of Iowa a few weeks or months ago suggested that there be a tax put on all commodities coming out of Iowa to help pay for the erosion damage.

So these things are being discussed.

Dr. COLACICCO. I might say something as an economist on that. There has been a fair amount of research on what is called nonpoint source pollution from agriculture. There are still policy analyses under way on how the cost is being borne and how should it be borne.

I think another thing that you were talking about—why aren't farmers concerned about the 50-year impact on productivity—I think they are partially concerned about that. However, there are also two things that enter into this I think. One is farming is a business. He may be renting the land or he has a mortgage he has to pay. That money has a price, the interest rate. We all know what has happened to interest rates recently.

Your pay-back period is a direct function of the interest rate. If the interest rate goes up, the term of your pay-back period gets much shorter for a particular expense.

Also I think there is some question on what are the long-term productivity impacts of soil erosion. We all know it is bad, but we do not know how bad. We do not know how to quantify the productivity loss, so to me it would present a problem as a farmer as to exactly how far I should go in investing how much money. Two hundred dollars an acre? Three hundred dollars? Two hundred and fifty-seven?

Mr. WEAVER. Will the gentleman yield at that point?

Mr. BROWN. Yes.

Mr. WEAVER. Thank you. Is less capital required for these techniques generally?

Dr. COLACICCO. In organic farming?

Mr. WEAVER. Yes.

Dr. COLACCICO. Generally I believe there is less capital required.

Mr. WEAVER. Thank you.

Mr. BROWN. I focused on this as a systems problem that probably does require more research. I am also struck by the comparability between this problem and the general problem of industrial productivity at this time. There have been some recent studies at the Harvard Business School and other places indicating that one of the main problems with American industry in general is that they did not focus adequately in their short-term accounting on the need to maintain long-term productivity increases. You can easily overlook the need to do this in the short run, because you can make a lot of money in the short run, but in the long run, your competitors get the best of you if they focus on long-term productivity increases while you are focusing on short-term profitability. It is a very important problem to the whole economy.

Thank you.

Mr. WEAVER. I thank the gentleman.

Does the gentleman from Montana have any questions?

Mr. MARLENEE. I thank the Chairman.

Dr. Colacicco, you referred to energy savings as being somewhere around 20 percent. That is, in the established practices that are now taking place in using organic wastes. Is that correct?

Dr. COLACICCO. Yes, as compared to conventional plow systems.

Mr. MARLENEE. Pardon me? Would you repeat that?

Dr. COLACICCO. That is, as compared to conventional systems where they use the moldboard plow. There are other technologies other than organic farming that are being used to respond to the high energy prices, soil erosion problem, such as no-till.

Mr. MARLENEE. For this waste, in regard to how much savings we can actually put into place in energy savings, the more intensive we become in organic farming, isn't there a reverse ratio of energy savings? In other words, there is not that much organic waste available. Did I not hear you say that in different terms?

Dr. COLACICCO. That is true.

Mr. MARLENEE. So we could not apply that 20-percent figure right across the board to all organic waste farming. In other words, the further you had to go to obtain the waste, the less the cost savings, the energy savings would be on these operations.

Dr. COLACICCO. That is true.

Mr. MARLENEE. In that case then, are we looking at organic farming as a complement or a replacement? Is it a complement to the present farming methods that we have?

Dr. COLACICCO. Yes.

Mr. MARLENEE. Is that the viewpoint of the panel?

Dr. PARR. It is certainly a complement in this balance between the two. I would like to say one thing. Most of the highly successful cases of good organic farming that we looked at were not importing any municipal wastes onto the land. The organic farming activity was going on very nicely without bringing any organic materials from the city or municipality or from another farm. It was mainly through animal manures and green manures and cover crops and legumes in the rotation.

Mr. MARLENEE. However, toward traditional farming it would complement traditional farming methods rather than replace chemicals, intensive energy consumption methods.

Dr. PARR. That is correct. That was not the intent of the report. Some of us get asked from time to time that aren't we going to have a heck of a time taking chemicals away from our farmers. If they say that to us, we know they have not read it, and that was not the intent of the report at all. To replace one farming system with another was not the intent.

Mr. MARLENEE. Actually with organic farming you can accomplish probably a more intensive operation than you can with traditional methods. Wouldn't that be so?

Dr. PARR. In some cases, yes.

Mr. MARLENEE. Would you tend to think that would be the case?

Dr. PARR. Yes; I think in some cases.

Mr. MARLENEE. Without achieving nonpoint source pollution and erosion.

Dr. PARR. Yes.

Mr. MARLENEE. I have no further questions.

Mr. WEAVER. I would like to commend the gentleman from Montana for making that extremely important point very clear. That is an excellent contribution.

Does the gentleman from California have any questions?

Mr. BROWN. I thank the Chairman.

Dr. Papendick, what I am hearing here is that most of the effort in your research has been directed to what we call dry land farming out where I come from. Does your investigation or study relate at all to the Great Valleys of California for example where we raise specialty crops? Has there been any research in that area? I know that we do have soil erosion and pollutants from agricultural wastes. What does your study do in relation to the problem in those areas, if anything?

Dr. PAPENDICK. My research has been primarily focusing on the Northwest, small grain regions. We have not extended out into the California area. That logically would be addressed by another group who is closer to the problem.

In other words, we pretty much are looking at small grain cropping systems under winter rainfall climate.

Mr. BROWN. Thank you, Mr. Chairman.

Mr. WEAVER. I thank the gentleman from California.

I really appreciate the excellent testimony by the three of you. It has been most helpful and most beneficial.

To get back on the problem of urban wastes being used in agriculture, I see the main problem as developing methods to dispose of urban wastes. At least that is what we have in my district. We would like agriculture to take it over if they can just to help us out, but the problem has always been these poisonous metals that are generally in it.

Just very briefly, can I carry some words back to Eugene, Oreg., that we can do something about this in your research? Have you discovered something we can do that they may not know about?

Dr. PARR. Absolutely. I preside over a research laboratory in Beltsville on municipal waste management and recycling and utilization. We are certainly very knowledgeable about industrial or-

ganic toxic materials, PCB's, PBB's, pesticide residues in sewage, toxic metals, and so on.

However, where these materials are excluded and kept away from the sewage plant, you have a good resource material.

Mr. WEAVER. But they are in the sludge, are they not?

Dr. PARR. Most of the metals come in from industrial sources wherever you have any metal plating or electroplating industries.

Mr. WEAVER. I see.

Dr. PARR. We are working with the sludge in the district here from the Blue Plains plant serving about 2.5 million people. The industrial flow that goes into that plant is very low. Cadmium, for example, which is what a lot of us are concerned about now, is only eight parts per million, which is very low.

However, some domestic wastes from sewage plants are very good. I do not know what the industries are in Eugene, but we can certainly work with those people.

Mr. WEAVER. I am certainly going to put them in contact with you, Dr. Parr. Thank you.

Dr. PARR. In many cases there is not a corps of extension people to transfer this technology. We spend a lot of time transferring this technology ourselves.

Mr. WEAVER. I would like some of it transferred.

I recognize the gentleman from California.

Mr. BROWN. Having hauled thousands of tons of sludge, let me see if I understand what I have learned. It has been my understanding that principally you will find trace elements in sludge. Can you tell me, for example in your studies with the local sewage treatment plan, what the nutrient value is in that sludge in addition to trace elements?

Dr. PARR. The sludges will contain quite an array of probably all of the 16 essential elements needed for crop growth. When you talk about the agronomic value of these materials, often people think in terms of the NPK [nitrogen, phosphorous, and potassium] values. Those are the three major, or macronutrients.

Sludges will vary in terms of the nitrogen level. I will give these in terms of percents. On a dry way basis, domestic sludges will vary from say 2 to 4 or 5 percent of total nitrogen. With phosphorous it will go from say 1 to 3 percent of phosphorous. With potassium sludges will vary from say a half a percent up to 1½ or 2 percent.

You are dealing with a low analysis fertilizer, but the value of these organic wastes is that all of the nitrogen for example is not available the first cropping season. You get a delayed or a controlled release of some of these nutrients. It all is not available the first year.

Certainly if you apply these materials you have to have an understanding of how much of that nitrogen will be available to the first year's crop, and then indeed supplement it with chemical fertilizers.

However, the second large value of organic amendments is that the organic material has a value, too. It is very high in terms of marginal soils if you are trying to restore the productivity of the soil. So you not only have the nutrient or the element value or the fertilizer value of these materials, but you have the organic materi-

al that improves the physical system so that it will respond better to chemical input.

You have all of the major elements there and micro or trace elements. Microelements such as copper, zinc, boron, manganese, molybdenum are all there, and they are present in sufficient amounts to sustain crop production.

Mr. BROWN. Thank you. I have no further questions.

Mr. WEAVER. I recognize the gentleman from Montana.

Mr. MARLENEE. Thank you, Mr. Chairman.

We have heard some discussion about the traditional methods creating nonpoint sources pollution, and yet there are some in the environmental community who would identify nonpoint source of pollution as cow droppings on a hillside. We have seen some direction within the EPA, the environmental community, and some concern of the industry—ranching industry in particular—with the addressing of these cow droppings as non-point source of pollution.

Wouldn't you be subject also to criticism by the misapplication or perhaps even the use of organic fertilizer as a non-point source of pollution?

Dr. PARR. Absolutely. Everything has limits, and most soils have loading limits.

Mr. MARLENEE. Maybe it is public education that we need.

Dr. PARR. Yes, indeed. Certainly you cannot impact the environment through the use of organic materials. I have seen it happen when tremendously high rates of manure were applied to soils for in excess of the recommended rate of application.

Mr. MARLENEE. I bring that up, Doctor, with tongue in cheek.

Dr. PARR. However, 10 years ago when the management of these wastes was more of disposal, the intent was disposal, not utilization. I saw tremendous amounts of poultry manure coming out of houses in Georgia loaded on some of those soils. Yes, indeed, you can cause some problems there.

Mr. MARLENEE. Farmers are pretty good economists in their own right. It appears to me that if it is cost-beneficial to utilize their wastes that they are going to do so. So I think that some of the implied criticism we have heard about the agricultural industry is not quite called for here.

I am not pointing a finger at the panel here, but sometimes we can overlook the fact that these people are bookkeepers and economists and bankers and managers, good managers.

Thank you.

Mr. WEAVER. Thank you very much.

There is some controversy surrounding leaving this stubble in fields and row crops to reduce soil erosion, and that therefore you have to use more chemicals because you have a more difficult time controlling the weeds and the pests. Is that right, Dr. Papendick?

Dr. PAPENDICK. Yes. Of course, that is one option. I talked about erosion control and the way that organic farmers—the ones who we studied--who were generally getting a higher degree of erosion control than were their conventional neighbors who were using the old standard tillage practices.

Now the option that is open that is not viable at the moment to organic farmers is no-till, and yet it is probably one of the best

prospects that we have in the future for controlling erosion—no-till agriculture.

Mr. WEAVER. There is no way around it. If you use no-till, you have to use more chemicals.

Dr. PAPENDICK. With the present technology there does not seem to be any other way; that is, with the technology today, we have to use more pesticides to control weeds and insects and in some cases even diseases.

However, in research we are always optimistic, and we see no reason why there could not be a way to farm no-till with less use of these chemicals. It is just that our technology today is such that this is where we are at, but that does not mean that we cannot venture further in the direction of less used of chemicals.

The organic farmers are using practices to retain more stubble and mulches near the surface, but they still use extra cultivations to control the weeds and to mix these materials around so they do not interfere with plant growth. They just have to make up for it with cultivation. Whereas with the conventional farmer who is trying to move into less tillage area—we find and it is not working in many cases; some crops it is working, with some crops it is not. We are having some tremendous difficulties with it in the Northwest. No-till is just not working out for us in every respect.

Mr. WEAVER. Why?

Dr. PAPENDICK. Because of increased weed problems and increased disease problems, which we do not seem to be able to overcome. That is technology today.

Mr. WEAVER. Gentlemen, thank you very much. You are excellent witnesses. We really appreciate your fine efforts.

I would like to call now Mr. Richard Harwood of the Rodale Press. Mr. Harwood has been one of the great leaders in this country in this movement. He has used his position to disseminate badly needed information. I want to compliment him highly on all the work he has done. We look forward to his testimony.

STATEMENT OF RICHARD R. HARWOOD, RODALE PRESS, INC., KUTZTOWN, PA.

Mr. HARWOOD. Thank you, Mr. Chairman.

I offer written testimony for inclusion in the record.

Mr. WEAVER. Without objection, a copy of your prepared testimony will be included in the record at this point.

[The prepared statement of Mr. Harwood appears in the appendix.]

Mr. HARWOOD. My own background has been 10 years of international work for the Rockefeller Foundation in the tropics in high technology agriculture. I have served on the National Academy of Sciences' study team to mainland China in the vegetable systems. For the last 5 years, I have progressed significantly in conceptual thinking about agriculture, I think, as I have been working as the director of the Rodale Research Center in organic agriculture. We have 17 professionals on the staff and 4 Ph. D.'s.

Most of our data come from on-farm as well as plot studies. We have a detailed study of a single farm in the eastern corn belt of Pennsylvania, and we are now in the middle of a 7-State study of

some 5,000 farms in cooperation with the Agriculture Experiment Station of Pennsylvania State University. Dr. Patrick Madden, one of their economists, is working full time this year on that study.

We have been focusing on the west coast States, but later this year we will be moving east as we look at other farms.

I think that this Organic Farming Act of 1982 has potential for major impact on mainstream as well as Third World agriculture. The impact on Third World agriculture is going to come more conceptually I think than it is in providing actual technology.

I discussed briefly here a shift in concept that is represented by organic agriculture. Much of the direction of U.S. agriculture in general is moving toward what we would call organic. This is best illustrated by the integrated pest management concept, which is a manipulation in coexistence with biological systems in agriculture rather than a dominance over them.

If you were to take the integrated pest management concept, carry it a few steps further to where we could conceivably make pests self-managing, with some manipulation in structuring perhaps, then if we would extend that concept to weed control and especially to fertility, we would come close to what organic agriculture is in its ideal sense.

Most of the benefits that we would talk about today to moving in this direction are economic. I think the environmental issues have to take a side light in times when we are in really tough straits. The environmental issues are important, but as I see this legislation and what you are attempting to do with this bill, it is completely apolitical. It does not have implications as far as I can see in the traditional conservative, liberal sort of sense.

To me, it deals with key issues which are mostly economic. These issues are going to become increasingly important in the next say 5 to 10 years.

Let me go over just a few of the characteristics of an organic, or perhaps a better word would be regenerative, farming system. First of all, the energy use is of key concern today. Let me just give a brief example as to where that energy savings might come from.

In an organic system, the farmer will structure the system to minimize the need for any input. If he is not going to use readily available chemical inputs, other sources are expensive, and they are hard to come by. If he is going to buy a nonchemical or an organic source of nitrogen, his costs are going to be higher. It is simply more expensive. So his system is structured to minimize the need for that input.

As an example of how that structuring takes place, in the eastern corn belt of Pennsylvania, a farmer may overseed a legume into a standing small grain. For instance, winter wheat would be overseeded into the legume in the springtime. If the farmer then turns around and plants winter wheat following that corn, he has absolutely no weed control costs.

We see this illustrated in several different farms mainly because the weeds have shifted in response to the row crop—the summer row crop of corn—over to a summer type of weed rather than the mustard that influences the wheat.

So you see, the system is structured to minimize those expenses, not only in weed control but in fertility.

An organic system has a different nutrient cycling process within the field as far as we can see. If it is well structured according to the sort of time-developed traditional practices, you have a net upward movement of nutrients in the soil profile rather than a net downward movement. In the organic jargon you would say that we rotate with a deep-rooted crop to mine nutrients from deep in the soil profile. We are getting measurements now to show that actually an organic system is reducing those nutrients farther down in the profile and concentrating them near the soil surface.

So we will see a farmer like Don Lamberts in Cheney, Wash., who Dr. Papendick referred to, the 800-acre wheat farmer, who actually has higher levels of soil phosphorous in his fields than his neigbors do who have been using conventional methods. This is in spite of 80 years or 70 years of farming with absolutely no nutrients being brought back on to that farm. He does not import any nutrients to the farm. He has been mining. Yet in the soil tests of the surface layers, his nutrient levels are higher.

This has economic implications in terms of more efficient use of the nutrients that you do apply to the system, and it has very important environmental considerations in terms of contamination of ground water.

To summarize the energy use system, the best data we have are from the Washington University study of Midwestern farmers showing that the organic farms used a total of about two-fifths of the energy, as Dr. Colacicco told us, of comparable conventional farmers. I think that is a fairly realistic estimate. Our data are showing that in other kinds of farms where you are producing cash grain the savings are about the same. Those are savings not only in nitrogen input but in the costs of weed control and the costs of pest control.

Part of that savings is from the legumes, part from crop rotations. Farmers are now starting to these because they realize the savings.

A second point that has not been brought forward before I think is there is a much higher return in an organic system to the investment in machinery. Today's farmer is really strapped to pay that high cost of machinery—the capital costs for buying it, the credit costs. If you look at the variable costs in an organic system, you will see that a higher percentage of variable costs is due to field operations in an organic system.

For instance, in eastern Pennsylvania we find that in corn silage 90 percent of the variable cost is a machinery based cost—the machinery and the operator—as compared to 65 percent machinery costs for the Pennsylvania State average. If we look at corn and grain, 83 percent is an organic farm's machinery and labor; 47 percent is the State average. On the State average, a much higher percentage goes into chemical costs—fertilizers, pesticides, herbicides. To some extent, those are being replaced by machinery costs, reflective again of the somewhat higher costs that Dr. Colacicco mentioned.

If we look at the total variable costs of this farm, which by the way are not too atypical of what we are finding on large-scale farms in other parts of the country with this Madden study, we find that organic corn in Pennsylvania has a variable cost of about

$75 an acre as compared to $116 an acre in the conventional system. In the conventional system, about $90 of that $116 is chemical input costs as compared to the machinery.

So what we are talking about is a farmer taking much better advantage of his capital investment in machinery rather than having the 200 horsepower tractor sitting under the shed while he applies his herbicide. So it has that built-in efficiency.

It is interesting in looking at the overall economics. I think one of the most significant points was brought out in a study done by Drs. Heddy and Olson at Iowa State University where they designed a computer model to hypothesize or to tell them what would happen if the entire United States were to go organic. Their conclusion was, among other things, that total farming income also would increase in all regions. In other words, they are saying that there would be an increase in farm income. Part of that would be because they were predicting a 5- to 10-percent decrease in production. I would argue with that figure also, because our data do not show that there is that much decrease. However, the cost of production would be considerably less.

Briefly, in soil erosion we have talked about that before. Erosion is decreased not only because of the cover crops, but also because of the decreased erosivity of the soil. It is not directly related to the organic matter content, but it is partially related. The soil has a different tilth, a different water absorption cabability, and you get less runoff as a result of that.

I think this Lambert farm in Cheney, Wash., is going to be the first data on that.

Now we have a problem on data in that we do not have definitive research. These data that we are talking about on differences between conventional and organic and especially with relation to the soil are based on across-farm comparisons. I think that is a real strong point in this bill—the first time you are looking at establishing full systems under research control where we can actually start to get hard data.

I want to touch just briefly on the extent of farms in the United States. Our best estimate is that there are 40,000 to 50,000 commercial organic farms, using the OSDA's estimate or definition of organic farms. Of our readership of 70,000, about 20 percent are pure organic. They call themselves organic. Another 40 percent call themselves partially organic. So under the USDA's definition, they would be considered organic as well. So 60 percent of our readership, according to our latest survey, are organic or partially organic.

Our January mailings drew some 10,000 new readers. Of those over 95 percent were in the 500-acre to 1,000-acre size category. So what is happening has been of some interest. The actual concern to us is that our readership is changing, and larger farmers now are becoming more interested in what we are doing. That new readership is not 60 percent organic. A much smaller percentage is organic.

Now let's look at the information needs of those people. In the surveys that we have done, we find that in many cases organic farmers will be using the same information that conventional farmers will use. They are roughly the same in terms of reading

Government publications. Twenty-nine percent of the conventional farmers said that was an important source of information; 24 percent of the organic farmers did.

The Government publications deal with component technologies—legumes, hybrids, this sort of thing. However, the big difference was in the county agents' responses. Forty-seven percent of the responses from our readers say that county agents are an important source of information to them. Twenty percent of organic farmers, less than half of the organic farmers, consider the county agent as an important source of information. County agents typically do not provide the organic kinds of information that they need and specifically the structuring of their systems to become organic.

Now to discuss the focus of this bill. I think it is extremely important that the research that the bill sponsors or would provide for be focused on what is covered in section 4(a), part 2. That is, the conversion methodology. I see the importance of this research as establishing a benchmark out here just a very few years ahead of where the mainstream of U.S. agriculture is going.

The work on legumes, on the use of sludges, or amendments of IPM is extremely important. I would not find fault with it; we need more of it. However, I think this small amount of money would be lost in the cracks if very much of it went into that type of work.

It really needs to be focused on what I think is the key issue. That is conversion strategies, because conversion research also gives you the direct comparison. Those kinds of data are needed before really the Extension Service is convinced that this is what all farmers should be doing. So I think that is the important focus.

If it comes to diverting other kinds of moneys, I would like to second what Mr. Sampson was saying, that we spend a terrific amount of money researching products and the effects of products. Our State experimentation budgets are overweighted with research on the effect of translocation of atrazine in the corn plant for instance. This is research that well belongs in the private sector. I think we have to be extremely careful where we spend our public money. We are talking about an area which is very distinctly not product oriented.

I have some comments about where this work might be done. There are several universities where conceptualization is already there. In two of them—Washington State University—the USDA already has a cooperative effort. As Dr. Papendick mentioned, they are already studying some of these farms. The University of Nebraska has a similar project, and there are a few others.

I will stop there with my testimony.

Mr. WEAVER. Mr. Harwood, again I just cannot commend you more highly. I cannot commend the Rodale Press more highly for the excellent work you have done, and your testimony here today has been outstanding.

You are in the information purveying business, and that is exactly what I see here. Of course, we have to have the research data. As you say, it should emphasize the whole and then get that information out. I was going to ask previous witnesses the very question that you have already answered on the county agents, because I suspected exactly that. It follows logically that they would be pur-

veying the information of what has been going on. To have that actual statistic in the survey of your people is most interesting and helpful.

There is no question that what we have heard so far asserts the really extreme need for the Government to develop the information and to get this information out to give our farmers the opportunity to incorporate the techniques that might be helpful and appropriate for them.

I just want to say that I hope Rodale Press continues your good work and I am sure you will. We hope to visit your farm up there soon. I am going to invite the subcommittee and other Members to visit that farm as soon as possible, because I think it will be helpful for them to see it on the ground. I am much more optimistic about the chances of this bill passing after the testimony we have heard so far.

Thank you very much. I appreciate your coming.

I would like to call two members of the farm community, Mr. Earl Lawrence, Virginia Association of Biological Farmers, and Mr. Jarlath Hamrock, Willets Produce, Willets, N.Y. Are both these witnesses here today? Good. Do you have prepared testimony?

Mr. LAWRENCE. Yes; I do.

STATEMENT OF EARL LAWRENCE, VIRGINIA ASSOCIATION OF BIOLOGICAL FARMERS, ROCKY MOUNT, VA.

Mr. LAWRENCE. Mr. Chairman and members of the subcommittee, it is a pleasure to be here today.

My name is Earl Lawrence. My wife, two sons, and I operate a 325-acre diversified organic farm in south-central Virginia. We raise vegetables, small grains, soybeans, hogs, chickens, and beef cattle. We sell our vegetables at local farmers' markets, and wholesale the grain and beans to cooperative warehouses. We also sell directly to individuals, many of whom come to the farm to pick up orders.

A growing number of these customers are victims of environmental poisoning.

I am a board member of the Virginia Association of Biological Farmers and the Carolina Farm Stewardship Association.

Let me begin my testimony with a brief history of my farming experience. I started in 1969 with no farming experience at all. I relied on the Extension Service for all information to grow a 1-acre tomato crop.

My first year of formula farming—spray schedules, herbicides, insecticides, and all the related modern methods—convinced me that there must be a better way. However, when I started looking for information, there was little or no information on organic farming available.

I applied organic gardening methods to large-scale farming. Some worked; most did not. I read all the books and magazines I could get and became convinced that by working with nature I could grow crops without chemical aids.

On a rented farm I grew both chemical and organic crops. As I learned and experimented, I became more convinced that organic methods could produce successful crops.

In 1971, I moved to my present farm. At that time I made the decision to become 100-percent organic on the new farm. Since the move, there has been no chemical fertilizers, insecticides, herbicides, or fungicides on my farm.

As one who could have greatly benefited from a program such as the proposed Organic Farming Act of 1982, I support this bill. It is important to move toward an organic farming system in this country. I believe the bill could change the direction of agriculture in America.

While I do support the bill, I have some reservations. My main concern is that land-grant colleges will be the only research agents. My exposure to land-grant college personnel has convinced me that there are few if any who understand reductionist research methods will not produce useful and meaningful information on the integrated systems of organic methods.

My experience indicates that a simple change in attitude toward organic farming is necessary before meaningful research can begin. I recommend that an advisory committee of experienced organic farmers be empowered to help direct experiments.

There are successful organic farmers with years of experience who could help eliminate useless and repetitive research, and there is a large body of existing knowledge that would be available to the colleges to save them both time and money.

The land-grant colleges have the facilities to do the research needed, but there are other colleges and groups who are far ahead of land-grant colleges in useful research. These should also be eligible for research grants.

It would also be very helpful to the volunteers if the old Extension Service and USDA publications were reprinted and made available to use in their consultations. Many of these pamphlets were researched and published before the advent of chemical agriculture and still present the best methods of organic agriculture.

I have been told by personnel in charge of releasing literature that there are legal questions about liability in doing this. If the old literature could be released again without this complication, it would eliminate that excuse for withholding these useful aids.

Finally, I would encourage the inclusion of standards for the qualifications of the volunteer farmers to insure that only experienced, well-trained organic farmers be included in the volunteer program. For anyone seeking information, the volunteer may be the only contact with the organic idea. It is very important that the volunteers be the best, and it is important that the volunteers be given the tools and training to do a good job.

It is very difficult to predict the responses to the volunteer program. I know that there are people who will gladly give of their time and knowledge to help. Virginia Association of Biological Farmers and the Carolina Farm Stewardship Association are two of many groups that have been organized to share information and experience with others. However, I am concerned that the most experienced and knowledgeable farmers are involved with their own farming and will find it difficult to give the volunteer program the time it will need. These concerns will need to be taken into account in designing the program's operating structure.

I know from my own experience that people do want information on organic farming. I get calls and letters and visits from people seeking information. The program will need a substantial number of volunteers with time and freedom to look at problems, research problems, and seek information from other organic farmers.

I praise the foresight that this bill represents. Although I have indicated some reservations, please know that I support this effort and hope it will be part of a growing acknowledgement that organic farming offers America a viable method of farming without the many and increasing problems associated with chemical methods.

Mr. Chairman, that concludes my prepared statement. I will make a few notes and comments to some of the things that I heard previously if I may.

Mr. Morrison, I believe, mentioned the codling moth. One of the basic concepts of organic farming is the holistic system. By taking one isolated element out of it and trying to analyze it and look at it, I think it avoids the basic issue that we in organic farming try to create. That is a natural system that is self-sustaining.

An example of that is—and I think that most organic gardeners and farmers have seen it at one time or another—where you have grown some tomato plants in your own soil and you do not have enough and buy a few for instance. The ones that you get out of a greenhouse are attacked by insects and the ones right beside it may not be.

I think the basic question there is why. In my thinking, it gets to the heart of what organic farming is all about, to ask those questions.

Another thing is in releasing some of this old information, there have been some comments I have heard about whether there would be some problem with the things that did not apply, things that may be dated to some degree. I hope that we will give farmers more credit for the ability to search out what they can use and disregard what does not apply to them.

I think there is some problem too in assuming that the people in charge—the USDA and the Extension Service—in my experience they really do not understand what we are talking about when you say organic gardening. I think it would be a mistake to depend on that knowledge and training. I think they would have a hard time throwing off and expecting them to give the information that a commercial, serious farmer who is depending on it for his livelihood will need in that transitional period.

Another thing that I thought was noteworthy was that even without research that the bill proposes, there is an indication that there are energy savings available right now, even without the additional knowledge we can pick up by looking at these methods more closely.

Another thing is that it is important to look at the whole system. The reductionist methods that land-grant colleges have used for years have served us well, but this is a different concept. If we are to create a soil that can create a plant that is resistant to insects, we need to know why so we can duplicate it in other areas and different systems.

Thank you very much.

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Mr. WEAVER. Thank you, Mr. Lawrence. To me that is very exciting, wonderful testimony. I have a small farm myself that I live on in Oregon. It is a weed patch now, because I simply cannot be there to do anything with it. However, you make me want to go back there and get out of this job. I know there are a lot of other people who would like to see me out of this job and farming like you do. [Laughter.]

I had exactly the same reservation about this bill that you did, about the land-grant colleges. I was looking for something to put in there, and your idea of a committee of organic farmers is an excellent one. I will try to incorporate it in some form. Spreading the research around I think is an excellent idea also.

I would like to say this. The land-grant colleges themselves badly need teaching and reform themselves. They might learn something, and that would be very helpful. So we will have to have some of this research done, in the land-grant colleges in hopes that they might learn too.

The chemical farmers and foresters that they have produced over the last generation make me shudder. Let's do something about it.

Mr. Hamrock?

STATEMENT OF JARLATH HAMROCK, WILLETS PRODUCE, WILLETS, N.Y.

Mr. HAMROCK. First of all I want to apologize this afternoon. My original intention was to bring a couple of farmers from New York with me to help me testify and present some testimony of their own. Although Cornell University has predicted a draught for 1982 extended through to 1985, it has been raining for 3 weeks. June is not necessarily a good time to ask farmers to come into Washington, I do not suppose. However, they could not make it. It did not rain yesterday, but I think it is raining today again in New York, and they probably should have come down with me, but they are trying to get something done.

My farm is a 350-acre farm in Cortland County, N.Y., which is what we call central New York. It is a typical hill farm. It is about 100 acres tillable, about 100 acres pasture. The rest is woods.

I will just go through my testimony briefly, because it is a bit long, about 16 pages.

Mr. WEAVER. Without objection, a copy of your prepared testimony will be entered in the record at this point.

[The prepared statement of Mr. Hamrock appears in the appendix.]

Mr. HAMROCK. The thrust of the first 3 or 4 pages of my prepared testimony has to do with the berry industry in New York State. What we see in New York, which really has lush grasslands and forage crops, is this kind of monolithic situation that is called holsteins. We have gotten away from producing quality milk over quantity milk, and I guess this has to do with the Federal price support program.

Also what we have seen is a national surplus of milk, but in New York State now we do not have a surplus of milk. The fact is that it is the third largest producer of milk behind California and Wisconsin. The Northeast is actually a 50-percent deficit milk-produc-

ing area, dairy area. I am not trying to criticize the milk industry. What I am trying to criticize here is the general farm policy that we have seen over the last 10 years or so.

So now we have what some people are calling a surplus of milk. I understand it is only a 20-day domestic food supply, but nevertheless it is called a surplus. Really what it is is a large inventory. We have seen large production increases in Minnesota and Wisconsin and 5,000 to 10,000 dairy dry lot operations in California and the Southwest.

So New York State is being jeopardized and the Northeast is being jeopardized by the so-called surplus of milk that we see. All I am trying to suggest is that we have had an imbalance in our price support system. You cannot have 80 percent of parity from dairy and 50 or 60 percent of parity for cash crops and expect not to see a surplus over time. Unfortunately as I say, the dairy farmers in New York are being jeopardized because of national policies.

The reason I bring this out is to show a kind of parable. In our research system, we see the same imbalance as we have seen in our price support systems. We have to try to correct this imbalance.

Basically, that is the thrust of my testimony. I support the Organic Agricultural Act of 1982, because up to this point there has been an imbalance in our research.

Mr. WEAVER. I would like you to continue with details about your own experience, sir.

Mr. HAMROCK. As I said, in 1971 we started farming. We were a curiosity in the area, because we were five farmers that came from—myself, I am from Massachusetts, so there were two others who came with me from Massachusetts and two others from Pennsylvania. So the five of us started this 350-acre farm in central New York. Of course, being in the middle of the dairy industry, we tried to raise vegetables, organic vegetables.

We have clay ground, but we grew very good vegetables. In fact a nutritionist from Syracuse University came down and harvested some of our vegetables and brought them back to his lab and said that they had the best nutrient value he has ever seen in his experience as a nutritionist.

Subsequently, we got a 2-year zucchini contract from Grand Union and a radish contract from P. & C., which is another local supermarket chain. Principally, we had problems marketing our vegetables. It really was not necessarily with culture. We had to cultivate in between rows, and this took a little extra time. However, I remember in 1976 when it rained every third day and no one had any sweet corn except for our farm because apparently we had more humus in our ground. What happens with conventional fertilizers is that with so much rain it just drops down to the subsoil, and sweet corn stopped growing all around the area, but our's did all right.

It was about in 1977 that we stopped growing vegetables, and we converted over to small grains—buckwheat—and then oats, and then finally we sewed our last crop of oats as a nurse crop to hay. Currently we have about 100 acres of mixed hay.

Cornell recommends, of course, that you straight seed alfalfa. We cannot do this. We have spread about 3 pounds of two different types of alfalfa, and we spread birdsfoot trefoil and along with that

some clover, and then of course we mix in some grasses, and we have excellent hay to this date.

We are not above using fertilizer from time to time. When I want to establish a catch crop or a winter crop and it is a little late because we have a short growing season up in the North country, I will put on a little fertilizer. Instead of getting it in by September 1, we have not been able to get that crop in by say September 20 or something like that because it might have rained, then we will spread a little fertilizer. But usually this gets plowed in the spring.

We do rotate as much as we can.

I guess what I want to point out is that the thrust of Cornell University in Extension right now is it seems to be no-till exclusively when it comes to modern farming techniques so to speak. I think this is a mistake. They are putting all their eggs in one basket.

However, I am behind no-till as much as I am behind conservation tillage. Cornell has been studying no-till for about 10 years now, and there are some difficulties. The biggest problem, of course, has been that you cannot have no-till more than 3 or 4 years without turning the ground over. Basically what happens is you have all this trash on the top of the ground that has to get turned, or otherwise you are not only using paraquat and glysophate, which is what we call roundup commercially in 2,4-D, but you also have to use insecticides as well as herbicides. You just have to turn that ground under.

Cornell has what they call their control plots. They have noticed a 60-percent germination. Of course, control plot in this instance would mean no-till without chemicals. They have seen 60 percent germination on clover. It is not 60 percent germination on alfalfa. Cornell is wild about alfalfa, you see, because alfalfa is queen of the forage crops, and cows milk a little better off on alfalfa than they do on clover. Clover is not necessarily an extremely valuable legume and cow feed. Sixty percent is not bad.

I support no-till, and all I am suggesting is that along with no-till we should have research along the lines of organic farming and conventional farming.

Mr. WEAVER. Were you a farmer before you started this, or were you a city boy?

Mr. HAMROCK. Let me see now. I was born in Boston, and then we moved to a chicken farm in Ohio. I lived out there for 3 years. Then we moved out to the metropolitan area. My father landed a job, so to speak, with a medical supply business in the New York metropolitan area.

I did not go to Cornell. All of the farmers think that I must have because apparently I am knowledgeable about certain things.

Mr. WEAVER. Are the four others who went in with you still in the business? Are they still farming with you?

Mr. HAMROCK. We were relatively young. In fact I was the youngest of them. Maybe that is why I am still with it.

Mr. WEAVER. Are you the only one left?

Mr. HAMROCK. No, I do have two other partners. We had a couple of silent partners. One problem we had was financing. Production credit and FmHA back 10 years ago did not want to touch us. So we had to look at private financing, and fortunately we

found someone in New York metropolitan area. You have probably heard of George Climpton. He has a brother who helped us out, and he is still a silent partner of ours. So he helps us.

This is not to say that we have not had help from the likes of FmHA. In 1977 we had a disaster there in New York State, and we lost 40 acres of buckwheat. Of course interestingly buckwheat is in oats, corn, sorghum, et cetera. It tooks us a year to finally get a disaster loan, but they gave it to us. By that time we did not need it, but I used it anyway. You have to sort of teach these people that buckwheat is also a commodity. As a matter of fact, you get $4.25 for buckwheat, which is considerably higher than corn. I do not understand why it is not considered a commodity.

What happened to the other three is that one got married and went to Harvard Law School. Now he runs a computer business in New York City. Another one went off to Iran to teach with the Iranian Air Force. It is almost history, but we are still running that farm organically.

What I want to point out is that it is not bottom ground, it is hardpan or what farmers call fragile pan. It is all over New York State. I would suggest that it is probably all over the Northeast.

Mr. WEAVER. I have one question to ask you, and I think it is the key question. You settled down in this valley in New York. Have there been any other farmers who have looked over your operation and emulated you? Has any of the information from your farm that you have developed been disseminated?

Mr. HAMROCK. There was an organization in New York called the New York State Organic Farmers Association, and we were one of their charter members back in 1972.

I would like to suggest that the dairy farmers right around us could almost be called organic farmers, because the dairy industry in New York has crop rotation—oats, corn, and alfalfa. Certainly they are going to spread some chemical fertilizer, and they will use some herbicides from time to time. However, in the context of what we have been speaking in this morning—a holistic approach—dairy farmers use quite a bit of organic farming techniques, including rotation.

To get back to your question, yes, they were a little skeptical, but I think they were more interested than skeptical. They still are interested.

Now I run the New York State headquarters for the American Agriculture Movement. We try to deal with price more than culture. I think that is why I am giving you testimony this morning. This could just be simply another way to reduce costs. The problem is that nobody knows. There has been a study done, but as skeptical as farmers in my area are of, for instance, Cornell University—I say skeptical because they hold the land grant schools in esteem as well as skepticism. You have to understand the nature of the personality of the farmer. Of course he went to high school, but he probably did not have the time to go to Cornell, although many of them did go to some of the 2-year agricultural schools.

What I am trying to say is that the information is not there for them to review. When we speak of New York, we are talking about 80 percent of the agricultural revenue in New York State is dairy related now.

I hesitate to say this, but dairy farmers are organic farmers. They will use chemicals and pesticides, but they are close to being what we considered this morning organic farmers. However, the information just is not there.

There are some new techniques as I say—no-till conservation tillage. We just had our second annual conservation tillage show in New York State, but there was no mention of organic farming.

Mr. WEAVER. Mr. Hamrock, that is excellent. I cannot thank you enough for coming here to give us the benefit of your experience.

Mr. HAMROCK. There is just two last things I would like to mention in connection with Cornell that was brought up this morning. There was some talk about growing clover in between corn. We do that currently, and we have done that in the past. In Cornell in the past 2 or 3 years, they have tried this finally. They do not call it organic farming; they call it living mulch.

However, curiously the funding for this has been eliminated, and this is a shame. The funding for this new living mulch program has been almost eliminated at Cornell because of budget cuts at that land grant school.

Also at that school recently there are a dozen graduate students who have gotten together, and they call themselves the Ecological, Biological Agricultural Research Group. They are working on a $1,000 grant from the Mellon Foundation, because they could not procure any money from the Hatch Fund.

This is what I am trying to suggest. I really feel that within the context of your bill you should possibly include an organic dairy operation, a demonstration project, particularly in the Northeast. It does not have to be Cornell. As critical of Cornell as I have been this morning, the University of New Hampshire will take it. I know that the University of Maine will probably take it. We have heard some suggestions that possibly some of this funding for researchers should go to a non-land-grant school, but just because Cornell will not take it does not mean some other land grant school in the Northeast will not.

Mr. WEAVER. Would you agree that the idea that Mr. Lawrence suggested of a committee to oversee the granting of these programs would be good?

Mr. HAMROCK. I think it is very valuable. The only problem is that I think farmers a few months ago or a year ago after Secretary Block became our new Secretary, farmers asked for an Agricultural Advisory Board at USDA. That did not fly. There is not one, and it is unfortunate.

However, there are many advisory boards at the Department of Agriculture, but that is one that did not materialize. I think it would be an excellent idea, and I also think to have some conventional farmers on that board would be just as valuable.

Mr. WEAVER. That is a good idea.

I want to thank both of you very much for coming and making excellent contributions.

Our next witness will be Dr. Warren Sahs, assistant director, agricultural experiment station, University of Nebraska, Lincoln, Nebr.

STATEMENT OF WARREN W. SAHS, ASSISTANT DIRECTOR, NEBRASKA AGRICULTURAL EXPERIMENT STATION, UNIVERSITY OF NEBRASKA, LINCOLN, NEBR.

Mr. SAHS. I am a crop scientist from the University of Nebraska, Lincoln. Also I own a dryland farm and an irrigated farm in northeast Nebraska with the help of the Federal land bank. So I get a little soil under my fingernails about every other weekend.

I do want to indicate, though, that I do not quite agree with Mr. Lawrence's statement saying that there is no expertise in the land grant system on organic farming.

Mr. WEAVER. You are living testimony of that, sir.

Mr. SAHS. Yes. I think that we get tied up in semantics. We went through that in the middle 1970's in Nebraska, and we have gotten away from that, the polarity of these two different groups. My written testimony indicates that we are thinking of alternate cropping systems—organic farming.

Mr. WEAVER. Without objection, a copy of your entire prepared testimony will be placed in the record at this point.

[The prepared statement of Mr. Sahs appears in the appendix.]

Mr. SAHS. I will point out that last December for 1 week in Atlanta, Ga. 3,000 agronomists attended a meeting of the American Society of Agronomy. The first day received the highest priority, a symposium on organic agriculture. There were 12 speakers from the United States. These are reknowned scientists in their own right, soils and crops men and an economist or two. We pulled 500 people out of 3,000 on that first morning session. That is the record. In the afternoon there were 300.

So it is not being ignored, but we do not call it organic. There are bits and pieces all over the place.

However, I would go along with his suggestion about having an overseeing committee, but do not leave out the land grant colleges. There are a few around.

Mr. WEAVER. No, Mr. Sahs. I completely agree with you.

Mr. SAHS. Let's go back to Nebraska. When I came in here yesterday, 70 percent of the corn was planted in Nebraska. We have had 10 inches of rain. That is one-third of our annual rainfall in May, and it is still raining, and it is still raining here. The midweek focus of the Omaha Herald indicates that we are 150 percent over. Even though we have only 70 percent of our corn planted, corn is still at $2.55 a bushel, and that is below the cost of production or at the cost of production depending upon top management.

So I have been an observer in northeast Nebraska, and there we have well-drained soils. I have seen sheet erosion. I have seen real erosion, but I have noticed that organic farmers or the alternate cropping system people such as the dairy farmer that the previous gentleman mentioned are good stewards of the soil. They have rotations—oats and clovers, soybeans, corn, soybeans—terraces, livestock farmers. The more manure you have, the more organic matter. It increases percipitation intake and you have less erosion.

We need a balance in our research and extension teaching programs. I might point out that 2 weeks ago, with a little prodding by myself and another professor or two in the Agronomy Department, the Institue of Agriculture and Natural Resources did set up what

I call a blue ribbon task force committee of 10 people on the staff. These are all the way from economists to plant pathologists and agronomists.

We are going to look at our programs in research, extension, and also teaching to find out if we are on balance within our own system. The top priority will be the economics of the alternate cropping system versus the conventional farmer.

We know that, as pointed out previously, when you switch you better switch slowly because you are going to have a drop in yield the first few years, and it is going to take a while for these organic residues to break down and become more available to the plant. There is a lag effect when you switch, and this should be taken into consideration by whoever is going to go in this direction.

We did notice in 1980 on organic experiments at the field lab which were replicated four times, and this was mentioned this morning by a previous speaker, that in those years when you have stress and you have heat and you have drought the organic plots will come through and make significantly better yields in those years when you have stress. In other words, a buffering of some kind takes place in the soil, and we are trying to find that out. USDA has come up with two graduate students funded by USDA. One will study the soil microbiology, and the other one will be studying the bulk density and the fiscal aspects of the soil.

So we are moving in this direction, and consequently I think that this organic experiment that we set up indicates you can control corn red worm by rotations; that the use of manure only with no chemicals will increase the phosphate and the potash in your soils. You will increase the organic matter, but it does it very slowly. We are bothered a little bit by weeds using just cultural practices such as rotary hoeing and cultivation on our plots. We have a buildup of weeds, and like one gentleman here said, you have to turn them under. Well, we have not reached that point yet. We are still using the conservation tillage, the disking, of these particular plots.

Last fall, another professor and I took the bull by the horns and set up an organic field day and also a farm tour. We were amazed. It was a day something like this, only it had rained only just prior to our getting together, and we came in with about 150 people, and we had three busloads of people who were interested in going to the field laboratory, of which I am a supervisor. We took a look at what we were doing there, all the way from kelp and fish oil and a few other soil amendments that are promoted in our particular area along with the conventional organic agriculture plot that has been in there since 1975.

The reason we went into it in 1975 was that my director at the experiment station came in one morning and he said we were going to start a project. I said OK, and asked who. He said me. So we got going back in 1975, and we had our ups and downs, but we are still running it, and we are going to run it for another 4 or 5 years.

What amazed me on this field day was that most of these fellows were middle-aged, younger farmers. Most farmers are old and grey-haired like I am, but there are a lot of younger farmers coming in, and these were the fellows that were there. They had their ears open, and they did not have any name plate on them indicating

that they were organic farmers, but they were looking for alternatives.

I think that within our educational program we have to come up with a balance so that we can show some of these people what their alternatives are and let them decide.

We are going to have another field day on August 25, and we are going to shift to the Northeast experimentation station. We hope to come in with a couple of hundred people.

I emphasize that organic farming is no panacea. It has its problems. It takes top management, but within our own system we are going to try to get some information out to our county agents. A lot of them out there are a little nervous right now as to how to handle the alternate cropping systems or the organic farmers. However, we hope to survey where we are and get some information out, not only from Nebraska but from anyplace else in the United States that we can get out to.

I thank you for the opportunity of being here.

Mr. WEAVER. Thank you very much. You partially answered my question with your last sentence. My question would be, What trend do you see occurring among the farmers in your area, and is the information getting out to them? You said very dramatically that the county agents were getting a little nervous because they felt the responsibility to get some of this information out.

Mr. SAHS. We are gung ho on conservation tillage. We got with that about a year and a half ago. I think from the standpoint of crop rotations that we have to reestablish a data base, because we have all kinds of data from the 1930's to 1950. However, you take new machinery and new varieties of seed and a little different way of handling it. I think we should run those through again and come up with some answers for some of these people who are thinking about getting into alfalfa, oats, and clover, and bringing in some of the sod crops that Dr. Papendick talked about.

Mr. WEAVER. In the farming experiments, do you use less chemicals than you had previously?

Mr. SAHS. Oh, yes. What we have are two extremes set up in this experiment station. This covers 10 acres. There are 52 plots, and they are machine planted and machine harvested. On the other extreme, we have manure only. Over on the other side, we have a monoculture of corn—corn, year after year—with a full dose of herbicides, chemicals, pecticides. Then in the middle we have a mix of rotations with and without. Our biggest problem is corn red worm. We have to put on about $8 worth of very potent chemicals every year.

However, if you go with oats and clover, corn and soybeans, 4-year rotation, you can eliminate that one factor. We have had very respectable yields on our organic plots where we put on only manure, that is this beef manure. The other plots, of course, get the synthetic fertilizers. Organic matter in the soil is going up on this side, and is going down on the other side. So we do have a graduate student in there trying to monitor what goes on in the soil profile. I think that is where we need to tie things down.

We get major crop yields real quick and easily, but we need to know what the goodies are down in the soil profile because it is

like putting money in the bank. You might want to draw on that 3 or 4 or 5 or 10 years from now.

Mr. WEAVER. How well is this information getting out, with or without the county agents?

Mr. SAHS. We are trying our best to get it into the journals, and we have what we call inept guides at Nebraska. These are quickies that we get out to the county agents. Of course having these field days, we did get good local press and television coverage. So the word is getting out, and we have not got it into the Journal of Agronomy Science because that takes time.

Mr. WEAVER. Of course that kind of information is going out to the leadership types, and eventually what we have to do is get it out again and again and again to each individual farmer so that they are completely aware of this, and so that they can make the choice.

I am going to ask you one more question, sir. You have just inherited a nice farm—300 to 400 acres. It is good land. You decided to make farming your full-time business right now. How would you farm it? I am talking about for your own self-interest.

Mr. SAHS. For my own self-interest and the interest of my children and grandchildren, I would probably do this. I would start about 25 percent with organic farming right now, depending upon the fertility level and the past history—weeds and that sort of thing. Normally I would take about 25 percent acreage and I would start organic right now.

Then I would use these other tools, like the herbicides and the fertilizer, to help me carry this other area. Then I would gradually move through it over a period of about 4 years and go all the way.

We do not tell people that they should switch 1 year on their full acreage because we have had some sad experiences with people who did not know how to handle the weeds.

Mr. WEAVER. The second question is, Is there general consensus on this among the faculty in your school and any other school you happen to know about, or is it controversial?

Mr. SAHS. That is a good question. In 1975 I would say it was about 75 percent of people who were not interested in this approach, and 25 percent were. Now I would say it is 90 percent in favor of alternate cropping systems or organic farming, and maybe 10 percent are diehards who are still pretty well hung up on the fertilizer bag.

Mr. WEAVER. That is very interesting.

Mr. SAHS. This was not by direct leadership. It is leadership, but I mean it was not a dictum from the front office at Ag hall. In other words, this is a gradual switching of opinions by each individual scientist as you went down the last 7 years.

Mr. WEAVER. That is very good. Dr. Sahs, thank you very much. Your testimony has been very helpful.

Mr. SAHS. Thank you.

Mr. WEAVER. Is Dr. Danny Kohl here?

[No response.]

Mr. WEAVER. Is Mr. Richard Koslow and/or Mr. Joseph Dunsmore here?

Mr. DUNSMORE. I am Mr. Dunsmore.

Mr. WEAVER. Mr. Koslow is not here?

Mr. DUNSMORE. Mr. Koslow is holding down the fort.
Mr. WEAVER. Good. Somebody better.
Mr. Dunsmore, would you proceed please?

STATEMENT OF JOSEPH DUNSMORE, ORGANIC FARMS, INC., LANDOVER, MD.

Mr. DUNSMORE. I would like to begin by explaining that we are not a farm. We are an organic marketing service, and we are a service for farmers. We market organically grown products. We carry a full range of organically grown products, and we have a direct relationship with growers. We contract growers. We help in their fertilizer needs, in their selection of seeds, their selection of varieties, and also in their insect and weed control problems.

I would like to begin by reading my testimony. It is slightly repetitious of what has already been said. Then I would like to bring out a few points of my own.

There is a growing concern from the public over the extensive use of toxic chemicals in agriculture. People are becoming more aware of the negative effect of these toxic chemicals on the quality of their lives and the quality of their environment.

It is apparent that much of our air, water, and soil are contaminated and getting worse. As we think about these conditions in our environment, I am frightened to think what it will be like 10 years from now for us and our children. Chemical runoffs from the fields are contaminating our water supply. Aerial spraying is randomly hitting our homes and schools. Nutrients in our soil are being depleted through improper management and concern for shortrun crop yield rather than long-term effect on soil.

The basis of sound agriculture is a healthy, fertile, and biologically active soil. Many organic farming practices are now accepted and implemented by large commercial growers as sound farming procedures. Alternating crops through crop rotation is now common. Modern biological controls are already working, as farmers have found it increasingly more expensive to kill these more resistant insects through chemical means. Health soil produces healthy plants, more nutritious and tastier food. Yet so much more needs to be done to encourage farmers to learn more about and implement modern organic farming techniques.

As we Americans are becoming more health conscious, we are reading more labels and questioning what is not on these labels. It does not take yet another study to reveal the direct relationship between toxic chemicals commonly in use and many of our 20th century diseases.

Educated consumers are demanding alternatives to the supermarket selection of chemicalized, highly processed foods. People are coming to us as they are literally dying for toxic-free foods. Let us consider the fact that presently everything that is commercially available to us has toxic chemical residues.

We at Organic Farms are the link between the organic grower and the educated health conscious consumer. We know first-hand of the demand for higher quality fresh fruits, vegetables, nuts, grains, beans, and dairy products. This demand is not only from the health food store shopper, but from consumers desiring more

flavorful and nutritious foods that are usually unavailable in the commercial markets. A source of greatest satisfaction is the overwhelming response we have received from our customers as to the produce grown by our established organic farmers. Our farmers grow varieties for their exceptional flavor rather than for appearance and shelf life.

As you can clearly see, the demand is already there and growing stronger as people realize they want to lead healthier, longer lives. Organic farming practices have already proven to be ecologically sound and viable and need to be further explored. We hope each one of you personally will care about the quality of your lives and your childrens' future to take the initiative in developing nationwide organic farming practices.

You can tell by my statement that I am in support of this bill. One of the aspects that I would like to really bring about as we talk about organic food is that we have covered the whole range from farmers and the need for farmers, but I think we need to cover the need of the consumer. We get tractor-trailer loads of organic produce to come to our warehouse, and it is produce that you never see on a commercial market. It is varieties of peaches, varieties of specially stone fruits and apples that are not commercially available.

Over and over again you hear people saying this is the best peach they have ever eaten, or that they have never had cherries like that, or they have never had a yellow seedless grape because in the commercial market they always pick them green before they have any sugar in them.

It makes me think about what is life and what is quality in life and what is the quality of our environment. When we eat food, why do we eat food? Do we eat food to fill our belly? There is that relationship between food and the quality of our lives, and I think that is something that really needs to be considered.

We talk about the economics of agriculture, and we talk about filling up the bushels and making money and things like that. However, I have not heard anything about the farmers who use a lot of spraying, happen to have problems with their kidneys or livers, or about people eating a lot of toxic foods getting health problems from the toxicity in the food. I know that because of our ages—especially mine; I am 30 years old—some of the older people here were raised on a basically natural diet because a lot of these chemicals that are in use today were not around in those days. But what about our children, who from conception are getting exposed? I have statements in a few places, including the Rodale Press, that a pregnant mother consumes 8 pounds of 10,000 chemicals in a term of pregnancy. We have to imagine, because we do not have any evidence of what those 8 pounds of chemicals are going to do to that fetus. We have to think about those things.

This is something that I think we all have to consider. It is very important.

Mr. WEAVER. Mr. Dunsmore, I could not agree with you more. All my life I have been deeply concerned about these chemicals. I started out my career by going to get a doctorate in what is now called microbiology. I have continued to read in biology since then. These chemicals go to the very genetic structure of our cells. And

we may not know what effect they have or on the possible mustations they may produce for 10, 20, 30, or 40 years on the fetus or on ourselves. It is very dangerous.

This of course has led me to an interest in organic farming. However, I believe in the law of simplicity, and that without question our farming will be more economic and more productive and we will have more delicious produce when we do use more and more of these methods.

Do you grow or do you handle square tomatoes?

Mr. DUNSMORE. No; we pretty much handle 100 percent organically grown foods by certified organic growers. We have little tomatoes and little trays that are grown in hothouses all around.

Mr. WEAVER. The lesson that really hit home with me was the change in the quality of tomatoes. New Yorker magazine had an article 3, 4, 5 years ago on the growing of tomatoes particularly in Florida. In that article they said all the research that had been done on it was how to grow it with more chemicals and the least amount of manual labor, how to pick it mechanically, how to store it, and how to ship it. They came out with this square tomato that bounced. It was an article about a pathetic, awful operation.

However, the article ended at that point, leaving you saying that that is ridiculous and stupid. It never mentioned one thing about other alternatives and people are still buying those square tomatoes that bounce. I do not. I have not bought a tomato in a store for I don't know how many years. They are not tomatoes. I grow and buy tomatoes around where I live. I am lucky enough to have them, and they are delicious, wonderful tomatoes. I would not buy one in a store. There are many things I will not buy in a store because they simply do not taste good.

However, most people still buy those tomatoes. I do not know why, but they do. There is a market for them, and God help us all, they are going to continue to grow them. It is the people's fault. They are willing to be suckered into buying that stuff. I do not know what they buy it. Maybe it is for decoration or for salad. When I get a salad, there are cardboard slices of reddish things that I guess are called tomatoes. What it is, I do not know.

I wanted to ask you this. You are a distributor of organic foods. Are you finding this profitable? Do you think this is a business that more and more people could enter?

Mr. DUNSMORE. I think it is totally profitable.

Mr. WEAVER. You better not say that too loudly. You may get too much competition.

Mr. DUNSMORE. Competition is something that right now I do not really have a problem with, although I foresee it in the future. One of the reasons is because of my generation, not enough people have enough agricultural background to handle produce. I farmed for 7 years myself, so I have a background with agriculture.

One of the aspects of the profitability of organic agriculture is that the costs of chemicals are going up, and you have to remember too that organic farms a lot of times have the highest yields. You will read a lot of times that an organic farmer in such and such a State had the highest yields for the State for corn. Maybe he did not grow 10,000 acres, but per acre he had the highest

yields. So we are finding that a lot of our organic growers are having very high yields, especially a lot of our vegetable growers.

I think one of the keys in organic agriculture that has been hurt in the past is that most organic farmers never had the capital to really get into it in the right way, or the expertise. This is why this information is so valuable.

I have a grower in California who just got a precision planter and a precision cultivator, and it does a tremendous job for cultivating, where they only have to go through the fields one time in hand weeding. Weed control for organic farmers is probably the hardest thing to deal. Everything else is fairly simple to deal with.

I think one of the problems is that because of modern agriculture people have never had good food before. So I think people really do not know what it is or what it tastes like.

Mr. WEAVER. I think you are right.

Mr. DUNSMORE. That is kind of sad when you think that people in America today never had a good peach or never have eaten a ripe grape or a tree-ripened apple or a tree-ripened fruit. They have had the dyed, waxed vegetables and fruits because everything is cosmetics now. So people do not really taste it. They only look at it. They only buy for looks. I guess if it looks good, it tastes good.

There needs to be a lot of education in that line, but what has to happen is that people have to start realizing and start tasting and realizing the nutritious aspect of food.

Mr. WEAVER. Mr. Dunsmore, what has to be done is that the market has to work. Your pros are going to have to drive out the others. That is all there is to it.

On that, I want to ask a question. That is, one of the reasons, if not the major reason, that we grow our produce the way we do, and harvest it while it's still green is because of real problems they have with spoilage and with transportation. If you live near a farm or you live near the country, as I do, you have opportunity to buy these things when they are fresh. I have a rule. I say I will buy produce when it is cheapest, because when it is cheapest it is best.

However, most people in large cities really do not have that opportunity, and the people who supply them have to harvest early in order to keep the produce from spoiling and to be able to transport it.

From your experience, do you think that it is possible to do it differently and still not suffer enormous spoiling losses and be able to transport and sell it properly in these large markets?

Mr. DUNSMORE. They make big piles of oranges, and they just let them rot there. They bulldoze them into a ditch. So we are talking about holding things over in controlled atmosphere, picking them green so that they will hold over, and real cheap prices, and farmers cannot make it because prices are too cheap.

However, then we have a problem of overproduction. Then on the other hand people are saying if they convert over they will not be able to feed the world. Here we are dumping it all in a ditch anyway. So I do not see how those two things relate.

Mr. WEAVER. When you pick the ripe tomato or the ripe peach, do you have a problem with spoilage and not selling it fast enough or whatever?

Mr. DUNSMORE. You have to be fast in marketing, and I think one of the reasons I got into the produce industry is because it is such a fast-moving market. Not very many markets go from midnight to 9 in the morning. It is a fast-moving market. It is constant. Most produce people are mean and like bears because they are so tired and overworked. That is how it is, because it has to move fast.

I think one of things when you are talking about fresh food is how many times have you bought apples and they have been mealy or bought oranges and they have been sour to where you do not know if you want to take the gamble. I think that is what has happened in marketing. People have been burned so many times from food that they do not eat fresh food anymore. They eat processed food, because processed food tastes the same.

Mr. WEAVER. I wouldn't go to that extreme.

Mr. DUNSMORE. There have been some studies done that people do not eat very much fresh food anymore. I would not want to put any money on it, but I think that people do not eat a lot of fresh food anymore in general. I think one of the reasons they do not eat a lot of fresh food is because they do not like—it just does not taste good.

I think if they would go some place and get peaches and grapes and they really tasted good then they would eat them, and they would eat them more. I think there is a subconscious thing there. If it tastes good, it creates a desire. If you go to the store and buy sour grapes, you eat them and something does not tick. You just do not want to get them again. Like anything good, you always want to try it again.

The produce market is a rough and fast market. Right now I have a tractor-trailer load of watermelons from an organic grower in Florida that I cannot move. He shipped them up and nobody wants to buy them. The market is flooded. Everybody has watermelons.

Mr. WEAVER. What are you selling them for? I have been wanting a watermelon.

Mr. DUNSMORE. I will probably sell them for fertilizer.

Mr. WEAVER. I am interested. I am in the market. They were 25 cents a pound last weekend.

Mr. DUNSMORE. They are selling for about 8 cents now.

Mr. WEAVER. I will be unloading one of those watermelons this weekend.

Mr. DUNSMORE. That is how it is. It is a supply and demand market. One minute it is 25 cents a pound, and the next minute it is 8 cents. On a retail level you do not see that, but on a wholesale level you see it to where you cannot even give it away. Nobody wants to deal with you.

Mr. WEAVER. One drink in a Washington bar is $3 to $4, and to pay that much for watermelon somehow seems outrageous.

Mr. DUNSMORE. For just water.

Mr. WEAVER. Both of them are just water.

Mr. DUNSMORE. Watermelon is like all our food. We generally pay more for transportation than we do for the food itself. If you take what the farmer is making and then add on the transportation and the brokerage and the retail, you notice that the farmer is really getting the short end of the stick, and there is not much you

can really do about it. This is because all those costs are real costs. In most things I pay more for the transportation than I do for the actual product itself, and those are costs that have to be realized.

One of the aspects that I think we have to start realizing, especially us on the east coast—and I know Rodale is doing a lot with it, and that is the cornucopia project that is developing regional self-sufficieny—we have to start realizing more and more and start regionalizing our food production. The east coast really needs to get its food production back east, because too many things that could be grown in the East are produced in the West.

Mr. WEAVER. I agree, but look what happened to the truck farmers in New Jersey. In the last 25 years, we have seen the disappearance of very localized farm communities. Now you are saying that we should reverse this. I agree.

Mr. DUNSMORE. Isn't that due to urban sprawl rather than an economic situation?

Mr. WEAVER. I do not know. My understanding was that the square tomato from Florida drove out the New Jersey tomato. People were willing to buy it.

Mr. DUNSMORE. Florida definitely has a seasonal advantage when you consider tomatoes. But I know that in my relationship with the market people do not buy. In about a month, there will not be any tomatoes coming from Florida. They will be coming out of Georgia and out of the Carolinas. Production of vegetables pretty much moves north. It is centralized in the Sun belt during the winter, but as the summer progresses, it goes north. So you do not find in New Jersey or in the New England area Florida tomatoes in the summer. People will be eating Jersey tomatoes or Pennsylvania tomatoes or wherever that area happens to be.

Mr. WEAVER. I hope so, Mr. Dunsmore. Thank you. It has been very, very enlightening to hear you. Does any member have questions?

Mr. DORGAN. I do not have any questions, Mr. Chairman. I just want to apologize. We had the budget to vote on on the floor and several other things. I missed most of your testimony. If I had known we were marketing watermelons in this room, I would have been here earlier. However, I did enjoy your discussion from a wholesaler's standpoint.

Mr. DUNSMORE. Since you just came into the room, I would like to say quickly that I really feel the point I would like to bring about is there is a quality in life, and it is a real subtle quality, and it has to do with our physical bodies, and it has to do with that vibrant health and that energy you get when you eat natural foods or toxic-free foods. It has to do with our mental attitude when we are not being overexposed to a lot of chemicals that do affect our mental outlook. It also has to do in a real spirtual sense, because when you get all these things combined and you get these qualities combined, it just seems to uplift the human individual. I think that if you draw that over the population you might see an uplifting in our society. You would get people who care more and have a little more life and feeling in them. Maybe that is a real generalization, but that is the feeling I have.

Thank you.

Mr. WEAVER. Thank you very much, Mr. Dunsmore.

The Chair will call the last witness, Mr. Fensterwald, and Rosemary West.

We did not know that the budget was going to be on the floor today when we scheduled this hearing, but I would like to tell my colleagues that this has been one of the most valuable hearings that I have ever had in 8 years in the Congress. The testimony has been basically this, and it has come from both the USDA witnesses and Mr. Harwood of Rodale Press, Dr. Sahs of the University of Nebraska, and two excellent organic farmers themselves who are just straight profitmaking farmers, Mr. Lawrence and Mr. Hamrock. The testimony has been that it is economic to switch to appropriate organic techniques where they fit and where they are workable. It is that profit margins are actually up; that the crops frequently take stress better; and that it takes less energy and less costs to produce.

However, the testimony has been that the necessary research is not being conducted. Even more important the information from what we do know from the 40,000 to 50,000 organic farmers out there—and we should not call them organic farmers but rather people who farm using organic techniques—is that this information is not going out to other farmers, and they are missing a real good bet.

The bill we have before us, H.R. 5618, simply sets up some pilot projects and has the USDA disseminate the information from the research available and from the pilot projects to the people. We have testimony from Dr. Sahs of the University of Nebraska saying that their research there is excellent. He himself, if he went into farming, would use many of these techniques. However, the information is not going out. The county extension agents do not know quite yet how to handle it and how to deal with it.

One other point was made that was an excellent one. That is that the chemical-based farming methods rely on commercial products. Therefore private industry has a strong profit motivation to get their information out. However, most of these other techniques do not have a commercial product. Therefore, there is nobody disseminating this information.

So it is a proper function of the Government to both do some of the research and disseminate some of the information. That is what this bill is about. It is a simple bill. It has been strongly supported here today. The administration did not support it, but members of the U.S. Department of Agriculture, in response to questions from the subcommittee, indicated that there was much to be said there for these techniques, and that they were working on them.

Mr. Fensterwald, would you proceed please?

Mr. FENSTERWALD. Good afternoon, Mr. Chairman. I am legislative counsel for the National Nutritional Foods Association, and we are very pleased to be able to appear today to testify.

Appearing with me is Ms. Rosemarie West, who is the current president of our association, and she will make a statement on our behalf.

Mr. WEAVER. Thank you very much. Won't you proceed?

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STATEMENT OF ROSEMARIE WEST, PRESIDENT, NATIONAL NUTRITIONAL FOODS ASSOCIATION, ACCOMPANIED BY BERNIE FENSTERWALD, LEGAL COUNSEL.

Ms. WEST. Mr. Chairman and members of the subcommittee, good afternoon. My name is Rosemarie West, and I am currently the president of the National Nutritional Foods Association. We are pleased to be provided with this opportunity to appear today and to provide testimony in support of H.R. 5618, the Organic Farming Act of 1982.

We believe that the bill is an excellent beginning in what we hope will become a national effort to improve American agriculture through the incorporation of sound, productive organic farming methods.

The National Nutritional Foods Association is the principal voice of the health food industry, composed of approximately 3,500 industry manufacturers, distributors, wholesaler-jobbers, and retailers located throughout the United States. Ours is an industry consisting primarily of small businesses. By last count, there are some 8,850 retail health food units in this country, including both independent retailers and health food sections of mass merchandisers such as Safeway and Sears. Health food stores are located in a variety of urban, suburban, and rural environments and come in all shapes and sizes, ranging from small health food concerns with less than 1,000 square feet of retail space up to large natural food centers which rival small supermarkets in comparison. Sales by all health food retailers averaged $210,000 in 1981 with total industry sales of $1.93 billion. Compare this figure to major supermarket chains such as Safeway and Kroger, with annual sales in excess of $9 to $10 billion respectively. That is an average of over $5 million per store. By these standards, we are still one of the small, but growing, guys on the block.

Mr. Chairman, we believe that few, if any, studies currently exist which adequately analyze in any detail the way in which organically grown products are distributed in this country. Rodale Press has, in the past, done some excellent work in this area, but their results are not definitive. However, let me offer to you a few of my observations on this subject.

First, the distribution of organically grown products, both produce and nonproduce items, in the United States, is generally recognized to be more informal and on a much smaller scale than the distribution of commercially grown food products. The market for these products is currently smaller, and the consumers who purchase them are much more diverse than consumers on the whole.

Many organic farmers who grow organic produce sell directly to consumers through a variety of methods, including farm stands, farmers' markets, pick-your-own concerns, neighborhood deliveries and local cooperatives. Others distribute their products more indirectly through local or regional distributors. Many of our retailers obtain produce this way, while others buy direct from farmers.

Second, because organically grown products continue to be specialized food items and not yet in the mainstream of American agriculture, they typically bring higher retail prices than their commercially grown counterparts. However, consumers obviously be-

lieve that this additional cost is well spent because of the investment put into the product by the organic farmer to insure their nutritional integrity and because of the benefits of paying from eating them.

Third, while only a sporadic national distribution for organic products exists at this time, to the extent that one does exist, members of the NNFA are currently very much involved in it. A large number of our retailers carry organically grown fresh produce, and still more of our retailers stock organically grown grain products which do not involve extensive refrigerated shipping and storage. Overall, 1 percent of our industry sales, approaching $200 million, involved organically grown fresh produce. This figure varies store by store; some sell no produce at all, while others account for upward of one-fifth of their gross sales in fresh produce. Likewise, the percentage of industry sales for grains and cereals and for bakery goods, much produced organically, in 1981 was 4.5 and 2.3 percent respectively. Thus, one can readily see that NNFA members are major purveyors of organically grown products.

Amongst our members are included some of the major producers of organically grown foods. An example is Arrowhead Mills, located in Hereford, Tex. They currently farm in excess of 1,400 acres in the northern Texas panhandle, producing a variety of organically grown grain products, including whole wheat, millet, buckwheat, corn, barley, triticale, and brown rice. All are grown without the use of chemical fertilizers, herbicides, or pesticides. They have been doing this successfully for over 25 years and their products are distributed in health food stores throughout the United States, via well-established health food distribution channels. I have today brought a sample of their products with me and invite you to examine them at your leisure.

Mr. Chairman, we believe the society benefits from a strong organic farming community for a variety of reasons, both environmentally and economically.

First, eating organically grown produce is healthier. Rachel Carson was one of the first in a long series of informed and concerned Americans to point out the danger to consumers of ingesting too many chemicals, be it fertilizers, pesticides, or herbicides. Her 1958 book, "Silent Spring," was clearly a watershed. Her prophecy later became truth as we witnessed products such as the pesticide DDT and the herbicide 2,3,5T removed from active use in 1972, followed by later suspension of chlordane, heptachlor, aldrin, dieldrin, mirex, toxaphene, and DBCP.

Eating organic products relieves consumers of concern regarding the introduction of unwanted chemical additives into the body. In addition, we have seen mounting evidence that growing agricultural products organically results in food which is more nutritionally complete than commercially grown products. Many producers have reported that organic products contain higher amounts of trace minerals, such as iron, calcium, and zinc. These, and other micronutrients are essential to good health. The key to the success of organic farmers lies in the fact that one of their principal aims is to constantly build and condition the soil, rather than apply expensive chemicals which, while providing adequate amounts of nitro-

gen, potassium and phosphorus, actually deplete the soil of other valuable nutrients, which brings me to my next point.

Over the past 40 years, Americans have witnessed a remarkable decline in the productivity of American soils. Increased erosion and decreased fertility have become the rule rather than the exception. Literally millions of tons of superior top soil has been washed away.

Organic farming is an attempt to reverse these trends. By the use of good commonsense management practices, organic farmers actually rebuild the quality of the soil they farm; literally an investment in the land.

Techniques involving crop rotation, crop residue, animal and green manures, legumes, and the addition of a variety of organic wastes and products have the same end result: they add to and maintain the productivity and tilth of the soil. They nurture, rather than destroy, a multitude of beneficial microorganisms which typically reside in well maintained soil. The humus of the soil is likewise increased, and with it the potential to produce crops which are nutritionally superior.

Organic farmers have incorporated a number of modified tillage techniques, such as shallow plowing, contour farming, and terracing, which have proven to be quite effective in controlling soil erosion. In addition, organic farming practices are environmentally sound. Because they incorporate a variety of nonchemical methods to fertilize the soil and to control weeds and pests, there is a tremendous reduction in the amount of harmful chemicals released into the ecosystem. Herbicides are replaced by mechanical weeding and preventive steps like crop rotation. Insects are successfully controlled by introducing natural predators rather than chemical pesticides. The end result is less harm to consumers, farm residents, and workers, wildlife, beneficial insects and to the beneficial microorganisms in the soil iteself. A byproduct of soil erosion control is less harmful siltation of lakes and reservoirs.

The bottom line is that organic farming methods are more cost-effective than conventional farming. While productivity may decrease in some instances, the reality is that is costs less to maintain productive soils than to constantly pay the OPEC countries their due for petroleum-based chemicals to constantly reinforce an otherwise sterile soil medium. To the extent that organic farming is more labor intensive, I for one would rather see farming resources spent to provide American jobs than fill OPEC's coffers unnecessarily.

Before completing my testimony today, I would like to touch just briefly upon an issue which may in the long-run affect the viability of organic farming as much as anything else that we may have discussed here this afternoon.

I speak of an alarming and growing trend in world agriculture where farmers are encouraged to plant increasing amounts of their land with a decreasing number of plant varieties. This trend, referred to as a monoculture, involves a process where farmers are encouraged or coerced to stop planting their fields with only genetically diverse crop varieties and to replace them with hybrid, high-yield varieties developed by the folks who brought you the "Green Revolution."

Recently, the National Academy of Sciences reviewed this trend toward genetic uniformity in the United States with these results. Seventy-one percent of our corn crop is comprised of six varieties. Fifty percent of our wheat crop is comprised of nine varieties; 96 percent of our pea crop in two varieties; and 69 percent of our sweet potato crop in one variety; and so on.

Some will ask the question, So where is the harm? Unfortunately, the harm is very real.

Problems of disasterous proportions have historically resulted from a lack of genetic diversity in plant varieties. The Irish potato famine in the 1840's resulted because of the genetically uniform potatos imported from South America were not resistant to a particularly harmful blight. Millions died, and millions emigrated.

Similar blights have in the past attacked the Ceylon coffee crop—the English now drink tea—the sugarcane crop, the banana crop, and others.

All stood helpless because of an inability to locate a diversely resistant strain which could quickly be called upon to replace the variety that had been damaged.

In 1961, 3 million bushels of wheat were destroyed by a wheat rust, resulting in two American wheatless days per week in 1917. As late as 1970, a corn blight destroyed one-half of the corn acreage in the Southeastern United States. In reaction to the 1970 crisis, the National Academy of Sciences commented as follows:

> The key lesson of 1970 is that genetic uniformity is the basis of vulnerability of epidemics * * * most crops are impressively uniform and impressively vulnerable.

Introduction of these high yield hybrids is often a very costly proposition. Farmers are forced to annually restock their seed supply from the seed company since the seeds, being hybrid, cannot reproduce themselves, but must be recreated from the parent plants back at the factory. The end result is that the farmer is forced to make a sizable seek investment each year.

Additionally, these hybrids were developed to respond well only to conventional farming methods involving heavy doses of expensive chemicals. The high yield does not come cheaply.

Another significant danger, as alluded to above, is that these varieties respond to chemical, not organic, farming techniques. As they continue to overtake the marketplace, the real possibility exists that organic farmers will find it increasingly difficult to locate sufficient amounts of plant varieties which respond well to their farming methods.

An example of how pervasive the need for chemicals has become in American agriculture, let me bring to your attention the now infamous MH-1 American tomato variety. Not only does this strain require the application of chemicals in order to make it grow and prosper, this variety can only ripen upon the addition of a spray that will get it ready at the appropriate time for market.

The principal culprit involved here is a well-known term in modern agriculture know by its acronym YUP, which stands for yield, uniformity, and processing. Thus, while consumers would more likely define its most important interests in genetic development as better nutrition and better taste, the agricultural research industry works toward a more productive YUP in their breeding ef-

forts, varieties which provide increasingly higher yields, more uniformity, and easier processing.

A disturbing example of this bias toward YUP can be seen in recent developments with the lowly, but very nutritious potato. Higher yield hybrid potato strains are constantly being introduced into Third World areas, especially South America, to replace the traditional cultivars grown in traditional centers of genetic diversity. Although higher in yield, they are much poorer in nutritional content, with an average protein content of 1.89 percent as opposed to an average of 3.24 percent for traditional varieties. Vitamin C amounts are much lower, too.

Mr. Chairman, I wish to reiterate the fact that this trend does not portend well for the continued viability of organic agriculture. These new hybrid strains developed during the "Green Revolution" of the 1960's and the 1970's simply will not perform well under cultivation by organic methods in the 1980's and beyond. They are too closely wedded to chemicals.

Mr. Chairman, as if things were not bad enough already, two additional factors are currently enhancing the problem.

First, we are seeing a continuing process whereby the major world seed companies are slowly being concentrated in the hands of the companies that produce and promote agriculture chemicals. Familiar seed companies such as Burpee, Ferry Morse, Northrup-King, and OM Scott have been placed under the wing of chemical giants like ITT, Monsanto, Purex, Sandoz, Union Carbide, Ciba-Geigy, and Upjohn.

Naturally, there is a corporate bias to conduct research and promote seeds which enhance sales of their chemical products.

Second, we are seeing a worldwide trend toward tougher and tougher plant patent laws. While we recognize that a firm investing a substantial sum in seed development should be able to protect its investment, we see such laws as allowing the seed-chemical conglomerates to overstep their bounds.

In some European countries, laws have been passed which actually make it illegal to grow plant varieties not listed on an official register.

More subtely the seed companies continue to promote their patented hybrid varieties as the traditional varieties are cast aside and ultimately lost forever. Again, Mr. Chairman, I cannot more strongly point out the effects this process will have on organic farming.

At the same time, Mr. Chairman, little is being done in this country to promote and protect those traditional varieties so important to the continued viability of organic farming.

While there are a number of seed storage facilities located throughout the world, they are chronically underfunded and understaffed. The National Seed Storage Laboratory in Fort Collins, Colo., continues to limp along on meager funding. Its budget to go out and collect varieties before they become extinct is paltry. Activities by the United Nations, through its International Board for Plant Genetic Resources, are likewise less than adequate.

Mr. Chairman, we believe that these trends represent tremendously difficult problems for organic farming, and therefore we offer the following recommendations.

No. 1 is a substantial increase in the appropriated funding for the collection and storage of our plant genetic resources, both private and through the National Seed Storage Laboratory.

No. 2 is monitoring of multinational seed-chemical conglomerates to insure that they do not overstep their bounds. Further, these companies should be required to participate in the collection and storage of varieties they replace. We would also recommend that the GAO be requested to study the effect that these trends are having and are expected to have on American agriculture.

No. 3 is development of agricultural incentives to farmers who grow older varieties or to those who devote a small portion of their acreage to endangered varieties.

Finally, we offer some suggested amendments to H.R. 5618 which would enhance the efforts of the proposed pilot projects and the Secretary of Agriculture to explore these problems further. We will provide them to you at the conclusion of the hearings.

Mr. Chairman, this completes my written remarks on behalf of the National Nutritional Foods Association. I again thank you for allowing me to appear here today to provide my input on these important subjects. For the future's sake, we hope your efforts are very successful.

Mr. WEAVER. Thank you very much, Ms. West and Mr. Fensterwald. Without objection, the attachment to your prepared testimony will be entered in the record at this point.

[The attachment follows:]

PROPOSED AMENDMENTS TO H.R. 5618

Section (4)(a)(1)—insert after the word "control" the following language—"the role of increasing genetic diversity in seed development efforts."

Section (4)(a)(2)—insert after the word "crop" the word "seed."

Section 5—after subsection (6) add a new subsection (7) as follows:

(7) Identify problems with current efforts by the National Seed Storage Laboratory to identify, collect, preserve, and disseminate seed varieties especially suited for organic farming and recommend ways to improve these efforts, both private and public.

Mr. WEAVER. I am absolutely, totally impressed with the people who have testified at this hearing. Your testimony was excellent. I had no idea of this thing about the seed companies being taken over by the chemical companies. I certainly will recommend a GAO study immediately on this.

I was very much aware, however, of the ideas about our monoculture. The wheat growers in my area right now are seeking funds to go out and find wild wheat grasses because they have let the original wheat go. They never kept any of it. It is crazy, but they did not. Now they want to breed back in original wheat into their hybrids to try to make it resistant to some of the diseases nature made it resistant to for many years. Unfortunately, they cannot find any.

You used the word extinct. We do not usually think about that, do we, in terms of plants? We think of it in terms of animals, but not in terms of plants, though that is exactly what it is. I think your testimony is marvelous. It is a very fine wrap-up for our hearing, and I want to thank you very much.

Does the gentleman from Iowa have any questions or comments?

Mr. BEDELL. I have no questions, except I think it is great that if you are going to furnish the chairman with some suggestions as to amendments or changes that you had proposed in regard to the legislation before us, if everyone would come before us with specific suggestions like that it would be very helpful to us.

Mr. WEAVER. I see that you have some right here, and we will certainly give them serious consideration.

I am entering in the appendix a copy of testimony by Debby Wechsler, co-coordinator, Carolina Farm Stewardship Association.

Without objection, there will be 10 legislative days for additional testimony in writing to be submitted in this hearing.

Again, I just want to thank and commend all the witnesses. It was an excellent, excellent hearing. I appreciate it, and I am very optimistic about the chances of passing this bill. I myself am impressed by its need much more than I was prior to this hearing, and I was already a strong advocate.

With that, the subcommittee is adjourned.

[Whereupon, at 2:35 p.m., the subcommittee was adjourned.]

[Submitted material follows:]

I

97TH CONGRESS
2D SESSION

H. R. 5618

To require the Secretary of Agriculture to establish a network of volunteers to assist in making available information and advice on organic agriculture for family farms and other agricultural enterprises, to establish pilot projects to carry out research and education activities involving organic farming, and to perform certain other functions relating to organic farming, with special emphasis on family farms.

IN THE HOUSE OF REPRESENTATIVES

FEBRUARY 24, 1982

Mr. WEAVER (for himself, Mr. BEDELL, Mr. DASCHLE, Mr. VENTO, Mr. SABO, Mr. GEJDENSON, Ms. MIKULSKI, and Mr. NEAL) introduced the following bill; which was referred to the Committee on Agriculture

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A BILL

To require the Secretary of Agriculture to establish a network of volunteers to assist in making available information and advice on organic agriculture for family farms and other agricultural enterprises, to establish pilot projects to carry out research and education activities involving organic farming, and to perform certain other functions relating to organic farming, with special emphasis on family farms.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SHORT TITLE

SECTION 1. This Act may be cited as the "Organic Farming Act of 1982".

PURPOSE

SEC. 2. It is the purpose of this Act to facilitate and promote the scientific investigation and understanding of methods of organic farming and to assist family farmers and other producers to use methods of organic farming to replace conventional chemical-intensive methods of farming. The purpose of this Act shall be achieved in a manner consistent with the family farms provisions of section 102 of the Food and Agriculture Act of 1977, as amended by the Agriculture and Food Act of 1981.

VOLUNTEER PROGRAM

SEC. 3. (a) The Secretary shall recruit, select, and train volunteers who have expertise in organic farming to advise family farmers and other producers who wish to make a transition to organic farming methods.

(b) While performing activities authorized by this Act, a volunteer shall not be considered a Federal employee except for the purposes of sections 2671 through 2680 of title 28, United States Code (relating to tort claims), and chapter 81 of title 5, United States Code (relating to compensation for injury).

(c) The Secretary is authorized to reimburse volunteers only for such necessary out-of-pocket expenses incident to their provision of services under this Act as the Secretary may prescribe, and, while they are providing such services away from their homes or regular places of business, for travel expenses (including per diem in lieu of subsistence) as authorized by section 5703, title 5, United States Code, for individuals serving without pay.

(d) The Secretary shall make available to volunteers, at local offices of the Cooperative Extension Service, office facilities, supplies, materials, and other related services which he deems appropriate to assist volunteers in performing activities authorized by this Act.

PILOT PROJECTS

SEC. 4. (a) The Secretary of Agriculture shall establish six pilot projects, taking into consideration the report and recommendations on organic farming, United States Department of Agriculture (July 1980), and giving particular emphasis to implications for the family farm—

(1) to develop and present scientific information on legume-based crop rotation, green manure crops, animal manures, soil acidity and liming in relation to nutrient release, intercropping, the role of organic matter in soil productivity and erosion control, and non-chemical weed and insect control; and

(2) to investigate soil, crop, weed, and insect management problems inherent in making the transition from conventional chemical-intensive methods of farming to methods of organic farming.

(b) The pilot programs established under subsection (a) shall be carried out through agreements with six land-grant colleges and universities located in and representing different geographical regions of the United States.

DUTIES OF SECRETARY WITH RESPECT TO ORGANIC FARMING

SEC. 5. The Secretary, acting through the Assistant Secretary of Agriculture who performs the duties necessary to carry out the National Agricultural Research, Extension, and Teaching Policy Act of 1977, shall—

(1) serve as a coordinator and consultant to land-grant colleges and universities in designing all pilot research and education projects adapted to serve specific regional organic farming needs;

(2) by January 1, 1984, make available to the public, through local offices of the Cooperative Extension Service, existing information on organic farming, such as that set forth under subsection (a) of section 4;

(3) make available to the public, through local offices of the Cooperative Extension Service, informa-

tion developed through implementation of the pilot projects established under section 4;

(4) obtain and maintain demographic information regarding producers engaged in organic farming;

(5) identify problems and needs of family farmers and other producers engaged in organic farming, with respect to information, support, and incentive programs related to organic farming;

(6) identify marketing and distribution problems and needs of producers engaged in organic farming who operate family farms; and

(7) identify public policy issues which relate to or affect organic farming.

REPORT TO CONGRESS

SEC. 6. Not later than the end of the calendar year in which a fiscal year ends, the Secretary shall submit to each House of the Congress—

(1) a report on the volunteer program established under section 3, and

(2) a report describing the activities and projects related to organic farming research and education, in which the Department of Agriculture participated in such fiscal year. This report shall include proposals for necessary authority and funding to address the needs identified in the report.

DEFINITIONS

SEC. 7. For purposes of this Act—

(1) the term "cooperative extension services" shall have the meaning given it in section 1404(5) of the National Agricultural Research, Extension, and Teaching Policy Act of 1977,

(2) the term "extension" shall have the meaning given it in section 1404(7) of the National Agricultural Research, Extension, and Teaching Policy Act of 1977,

(3) the term "land-grant colleges and universities" shall have the meaning given it in section 1404(10) of the National Agricultural Research, Extension, and Teaching Policy Act of 1977, and

(4) the term "Secretary" means the Secretary of Agriculture.

AUTHORIZATION OF APPROPRIATIONS

SEC. 8. (a) There is authorized to be appropriated such sums as may be necessary to carry out the volunteer program established under section 3 for fiscal years 1984, 1985, 1986, 1987, and 1988, which sums shall remain available until expended: *Provided*, That the total amount appropriated to carry out the volunteer program for such fiscal years may not exceed $5,000,000.

(b) There is authorized to be appropriated $250,000 for each of the fiscal years 1984, 1985, 1986, 1987, and 1988 to carry out each of the pilot projects established under section 3(a). None of the funds authorized to be appropriated by this subsection may be expended for administrative expenses incurred by the Secretary to carry out section 3.

(c) There is authorized to be appropriated $400,000 for each of the fiscal years 1984, 1985, 1986, 1987, and 1988 to carry out section 4 and section 5.

EFFECTIVE DATE

SEC. 9. This Act shall take effect October 1, 1983.

O

DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON, D C 20250

June 9, 1982

Honorable E (Kika) de la Garza
Chairman, Committee on Agriculture
U.S. House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

This is in response to your request for a report on H.R. 5618, "The Organic Farming Act of 1982."

While the Department is sympathetic to the objective of the legislation which is to provide farming alternatives to producers, and especially family farmers through research and educational programs, we do not recommend enactment at this time.

Section 3 of the bill requires the Secretary to recruit, select and train volunteers to advise family farmers and other producers who wish to make a transition to organic farming methods. Such volunteers are not to be considered Federal employees except for purposes of the Federal Tort Claims Act and the Federal Employees Compensation Act. Further, the Secretary is authorized to reimburse certain expenses, including travel expenses, incurred by such volunteers incident to their provision of services. Section 3(d) of the bill provides that the Secretary shall provide the volunteers with appropriate office facilities, supplies, materials and other related services at the local offices of the "Cooperative Extension Service."

The term "Cooperative Extension Service," which is used throughout the bill and which in general usage refers to the combined programs and resources of the State cooperative extension services and the Federal Extension Service, is not defined in the bill. The term "cooperative extension services" is defined by section 7(1) of the bill to mean the organizations established at the land-grant colleges and universities under the Smith-Lever Act (7 U.S.C. 341-349) and section 209(b) of the Act of October 26, 1974 (D.C. Code, sec. 31-1719(b). (It should be noted that this definition does not include the extension programs of the 1890 land-grant institutions, which conduct extension work under the provisions of section 1444 of the National Agricultural Research, Extension, and Teaching Policy Act of 1977, as amended).

Thus, it is unclear but it appears that the intent is for the volunteer staff to work out of the local offices of the "cooperative extension services." Since the "cooperative extension services" are organizational units of the 1862 land-grant colleges and the University of the District of Columbia, the bill leaves doubt as to the Secretary's authority to furnish local office space

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through them; and the means by which the total of $5 million authorized to be appropriated for the fiscal years 1984 through 1988 could be utilized to pay the costs of the volunteer program. That is, it is unclear whether the program is to be administered by the awarding of grants to the "cooperative extension services" for the costs of recruiting, selecting, and training volunteers and other program costs; or whether some other relationship is contemplated.

If funds are allocated to the states for this purpose and assuming the volunteer staff will be under the direction of the CES Directors, it is apparent that the recruitment and training of such a volunteer force, given the diffuse nature of the information, would require that a commitment be made by CES Directors, using appropriated funds under H.R. 5618, to establish positions to give leadership in the compilation of applicable data and the development of educational programs to train said volunteers. Volunteer staff could be developed along the pattern of the "Master Gardener" program, but with fewer volunteers. Considerable time would be required to develop the volunteer staff. It should not be expected to be functional within the first one or two years after funding is made available. Since H.R. 5618 authorizes an appropriation of not more than a total of $5,000,000 for fiscal years 1984-1988 for activities carried out under section 3, it seems advisable that the volunteer program be developed in the States in which the pilot projects required by section 4 are to be established.

Section 4 of the bill requires the Secretary to establish six pilot research and education projects on organic farming to be carried out though agreements with six land-grant colleges and universities (including 1862 and 1890 institutions as well as Tuskegee Institute) in different geographic regions of the United States. For the fiscal years 1984 through 1988, there is authorized to be appropriated $250,000 each year for each project. It is assumed that these projects are to be funded under grants or cooperative agreements, but the intent of the bill is unclear. From a scientific standpoint, it would seem the language of section 4(a)(1) (page 3,line 2) should include a reference to disease control also.

Sections 5 and 6 of the bill require the Secretary to coordinate all pilot projects; make available to the public through the "Cooperative Extension Service" by January 1, 1984, all existing information on organic farming; make available to the public through the "Cooperative Extension Service" information developed through the pilot projects; obtain and maintain demographic information regarding producers engaged in organic farming; identify marketing and distribution problems of family farmers engaged in organic farming; identify policy issues relating to organic farming; and to report annually to the Congress on activities related to organic farming undertaken.

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The report to the Congress required by section 6 is due at the end of the calendar year in which the fiscal year ends. Since research for the current year will not be finished until October-November, depending on the length of the growing season, then analyzed at each institution and submitted to USDA for an overall report, a due date of January 31 or February 28 would appear more workable. Additionally, regarding research results, there would probably be little to report during the first year or two of the program because much of the research specified in the bill is the type that would take several years of field plot work before much progress is achieved.

For the fiscal years 1984 through 1988, the bill authorizes $400,000 to be appropriated each year to carry out sections 4 and 5. (It is assumed that the reference in section 8(c) of the bill to "section 4 and section 5" should read "section 5 and section 6").

To effectively implement the features of H.R. 5618 would require, as a minimum, the full authorizations provided for in the bill and could require major redirections of funding which would have an adverse effect on the Department's current research and extension programs. At a time of budget stringency, we must exercise management restraint in initiating new or expanding current activities. The Department has several ongoing programs that relate to the needs of organic systems. For example, the effects of nitrogen cycling and utilization on crop production, the use of municipal organic wastes on croplands, the effects of soil fertility and soil tilth on the production of economic crops, the use of animal manures as a source of plant nutrients, the development of pest resistant plants, biological pest control techniques, and the effects of organic matter on the growth and survival of soil borne plant pathogens.

The Office of Management and Budget advises that there is no objection to the presentation of this report from the standpoint of the Administration's program.

Sincerely,

JOHN R. BLOCK
SECRETARY

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STATEMENT
of
Neil Sampson, Executive Vice President, NACD
to the
Subcommittee on Forests, Family Farms,
and Energy
of the
House Committee on Agriculture
on

H.R. 5618
The Organic Farming Act of 1982
June 10, 1982

Mr. Chairman. Members of the Subcommittee:

I am Neil Sampson, Executive Vice President of the National Association of Conservation Districts, a private, non-profit association representing nearly 3000 local soil and water conservation districts that cover virtually all of America. The people who run those districts, and the farmers who cooperate in their voluntary local programs, are dedicated to soil and water conservation, and support USDA programs that help farmers develop farming systems that include proper care of the land.

Most of those conservationists are not "organic" farmers, in the sense that they refuse to use any chemical soil amendment or pesticide. In fact, most of them would be classed as "conventional" farmers. But they are conventional farmers who are, in the main, concerned with those aspects of today's high-technology agriculture that reduce soil protection and conservation. Many of them still use crop rotations. conservation tillage, and other methods to build and protect their soils. Most of them are on the lookout for any method -- new or old -- that makes both economic sense and improves their conservation system. Organic farmers, working with the latest in scientific and technological insight, can be one source of new innovation and information for conservation farmers.

The methods espoused by organic farmers are much the same as those advocated in the "old days" by the early soil conservationists: crop rotations and green manures to build soil quality, improve soil tilth, and maintain high soil organic matter. These basic ideas, so "out of style" in modern agriculture, still have a great deal of merit. Today, when agriculture is showing signs of both financial and biological weakness, it is useful to ask what can be learned about "mid-way" techniques that pick up on some of the soil-building and cost-reducing ideas of the organic farmer, yet retain some of the technology that the conventional farmer still feels is economic or necessary to use.

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In the area of soil conservation, to no one's great surprise, organic farmers receive high marks from all who have investigated their methods. By using cover crops, green manure crops, legumes in rotation, and animal manures to keep soil organic matter high, these farmers increase soil infiltration rates and water holding capacity in their soils. This, in turn, reduces runoff, soil erosion, and subsequent losses of water, topsoil and nutrients.

But there are limits in organic farming. Organic plant nutrients don't offset the slow decline of phosphorous and potash in the soil. The amount of nitrogen that can be produced by legumes in a crop rotation will not always give top yields of high-nitrogen-using crops like corn. The total production of organic farms is reduced because of the acres committed to soil-building crops. Whether the total production from an organic farm represents a long-term sustainable level of soil output, as compared to a conventional farm which may be producing at levels the soil is unable to sustain, is a question which, as yet, has not been adequately addressed.

There is also a definite 3-5 year transition period in switching from conventional to organic methods during which, as the soil and crop system gets fully established, yields may be down and losses to insects and weeds may be serious.

In other words, there is much that needs to be known about organic methods and their applicability to today's agriculture. Among the main questions that will be asked are those that are most specific and localized in nature. Farmers will want to know what they can do, on their land, given the soil, climate and cropping history peculiar to it. This argues not so much for broad national research efforts leading to generalized answers, but the kind of local, hands-on approach that provides interested farmers with specific, practical suggestions.

In light of these views, H.R. 5618 seems to be the right kind of approach to this subject at this time. We would have a few comments and suggestions directly about the bill for the Committee's consideration.

Section 3 establishes a program of volunteers to assist farmers, with USDA required to recruit, select, train and provide support to this volunteer cadre. We support the use of volunteers in USDA, where they are used to supplement, rather than replace, the professional agriculturists needed to provide assistance to America's farmers, but the authority for the Secretary to carry out such an effort was contained in Subtitle G of Title XV in the 1981 Farm Bill, P.L. 97-98. The merit in H.R. 5618 might be to focus the Secretary's attention to the specific needs of organic farmers, and perhaps start something that would not otherwise be done, but creation of basic authority for the use of volunteers in USDA is not essential.

There is also a danger in attempting to do too much with volunteers. If providing additional services to individual farmers who need advice on organic methods -- or any other methods to cut costs and raise profits -- is to be a high priority at USDA, the basic services must come from professionals within the established agencies. Volunteers can help stretch existing resources; they cannot be asked to replace them, or to conduct a program that does not have the full involvement, support and leadership of the USDA professionals.

The act hinges on a term with meanings that are not always agreed upon -- organic farming. Realizing that there is going to be some contention, no matter what you do, we would suggest that you add a definition of "organic farming" in Section 7. The definition that would probably be best to use now is the one adopted by USDA in its 1980 Report and Recommendations on Organic Farming, as follows:

> "Organic farming is a production system which avoids or largely excludes the use of synthetically compounded fertilizers, pesticides, growth regulators, and livestock feed additives. To the maximum extent feasible, organic farming systems rely upon crop rotations, crop residues, animal manures, legumes, green manures, off-farm organic wastes, mechanical cultivation, mineral-bearing rocks, and aspects of biological pest control to maintain soil productivity and tilth, to supply plant nutrients, and to control insects, weeds, and other pests."

One final suggestion: There is a great deal to be learned about the management and use of organic wastes on farmland. As more and more municipalities and industries install sewage treatment plants, the amounts of sludge captured by these plants creates a tremendous disposal problem. With proper pretreatment to remove hazardous materials and heavy metals, sludge and other organic wastes can offset a portion of the need for fertilizers on croplands. USDA should be given specific legislative authority and appropriations to work with both waste producers and farmers so that a potential problem in urban America is converted into a resource for agriculture. Because of its close connection with many of the methods used by organic farmers, it would make sense to attach this authority to the bill before the Committee today.

With those suggestions, Mr. Chairman, we would encourage you to press for adoption of H.R. 5618. We think a program such as it envisions could be a substantial aid to many farmers at very little cost to the public. The effort could help generate a gradual shift away from soil-depleting agricultural methods toward a more sustainable, regenerative form of production. We think such a shift is essential to the welfare of the Nation, and urge you to continue to work in that direction.

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A Testimony on HR 5618

THE ORGANIC FARMING ACT OF 1982

97th Congress, 2D Session

Offered by Richard R. Harwood
Rodale Press, Inc.

June 10, 1982

Summary

The Organic Farming Act of 1982 has potential for major impact on mainstream American (and third world) agriculture as well as impact on present-day organic practitioners. Impact areas on mainstream agriculture which I will briefly address here will be:

1. Its focus on technologies which bring about a substantial reduction in production cash inputs.
2. Its focus on farming systems (enterprise combinations) which achieve a much higher return on machinery investments.
3. Its focus on an increased diversity of farm enterprises which give the farm greater economic stability.
4. The major reduction in soil erosion achieved as a result of a shift toward organic (regenerative practices).

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A Shift in Concept

We are emerging from the pre-1972 decade of euphoria over early green revolution successes and the general attitude that science will, in short order, "conquer" nature. Our optimism has been dampened by the following conditions and realizations:

1. The exponential rise in energy cost over time since 1972.
2. The corresponding exponential rise in the price of agricultural nitrogen and other heavily-used, energy-dependent inputs.
3. The high capital costs of mechanization (and the under-utilization of that machinery) in a single-crop or single enterprise type of farm. (Our farms have become over-specialized.)
4. The non-sustainable levels of soil erosion generated by modern, intensive cropping practices.
5. The growing awareness of the fragility of our environment (to groundwater contamination, to accumulation of biocides, etc.).

Agriculture in America is shifting (rapidly in some instances) in response to these conditions and realizations. We see increasing use of perennial legumes as overseeded or rotation crops. That increase is phenomenal in some areas, such as with corn in Delaware. There is increasing use of Integrated Pest Management and of conservation tillage.

All of this is symptomatic of a change toward manipulation and coexistence with biological systems in agriculture rather than a dominance over them. This is the shift in concept.

HR 5018 is designed to hasten that change process, and through its research component, to establish a benchmark or target which will be a short period of time ahead of mainstream agriculture.

HR 5618 in my estimation has nothing to do with political positioning in a conservative/liberal sense. It deals with key issues which are mostly economic. These issues will be increasingly important as we continue toward resource scarcity in the next decade.

Relevant Characteristics of an Organic (Regenerative) Farming System

1. Energy Use

By structuring the farm system (arranging certain types of crop rotations or crop/animal combinations), the nutrient flow, weed shifts and insect/predator balances can be altered to reduce input needs and, in general, the cash production costs.

For example, in the eastern end of the corn belt in central Pennsylvania, a legume overseeded into standing small grain will reduce weed control costs in corn in the following year by one third. In small grain following that corn, in turn, there is no weed control cost. The numerous other benefits in that rotation include the elimination of the need for rootworm control in corn.

In comparative studies of beef-producing corn belt farms, Lockeretz found that "the organic farms required about two-fifths as much fossil energy to produce one dollar's worth of crop." (1)

Studies now underway for farms where the difference in structure between organic and conventional is greater than for these farms indicate that these results are not atypical.

2. The Higher Return on Machinery Investment

Our work at the Rodale Research Center has two dimensions in whole-farm studies. We are doing a seven-state study totaling about 5000 organic, partially organic and conventional farms as a joint project with the Pennsylvania State Experiment Station and Dr. Patrick Madden of the Agricultural Economics Department. A second focus is a single-farm study of a 322 acre organic livestock/crop farm in eastern Pennsylvania with Dr. Earl Partenheimer of the Pennsylvania State University. The data from the single farm show that it has many characteristics of the broader sample of farms.

Preliminary analysis of the Pennsylvania farm shows the following:

Field Operation (machinery-based) Cost as a Percent of Total Variable Cost of Production

Crop	Organic	Pennsylvania State Average
corn silage	90	65
corn grain	83	47
soybeans	79	64
wheat	81	64
barley	84	66
rye	81	61
oats	85	64
all small grain	83	64
alfalfa hay	64	61
mixed hay	82	68

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A comparison of the actual variable costs for that farm show:

Crop Production Variable Costs, 1982
(per acre)

Crop	Organic	Pennsylvania State Average
corn	$75.25	$116.90
yield (bu)	121	93
wheat	$85.51	$102.45
yield (bu)	41.8	36.0
soybeans	$72.80	$ 81.20
yield (bu)	44.0	31.0

The significance here is that while variable costs are the same or lower, a higher percent of that variable cost is the machinery and operator time. Present day agriculture is plagued by high equipment costs. On a modern farm, the 200 horsepower tractor is used for very few weeks a year. Likewise the combine may be used for a single crop over a short time. On organic farms the tractor size tends to be smaller, but it is used over a much longer period. This is largely caused by the higher diversity of cropping, with fewer acres to cover at a given time for a given crop.

With increasingly high prices for nitrogen, it is becoming more and more profitable for a farmer to "grow his own" nitrogen. A widely overlooked fact here is that a relatively high proportion of that legume nitrogen cost is machinery time rather than the cash input for fertilizer. This machinery demand generally comes at times when there is not a demand for other operations, so the trend is to increase equipment efficiency rather than capital costs.

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The much-quoted Heady-Olson model, used to estimate the effects of a total shift to organic agriculture concluded:

"Total farm income also would increase in all regions."

3. Soil Erosion

There have been many observations and claims that organic practices decrease soil erosion. The widespread use of perennial legumes seems to be a major cause as cited in the USDA's report on organic agriculture. (2)

There have been few direct comparison measurements of soil loss because of the difficulties of across-farm comparisons. Present data being compiled at Washington State University indicate that on a 780 acre organic wheat farm in the Palouse area of Washington, the erosion rates in comparable fields (slope, tillage) show that the erosivity of the soil to water runoff is about one fourth or less than that of adjacent conventional farms. (3) This can be added to the greater protection from overwintered legume crops on much of the land. These data support the many observations and comments from organic farmers who say that their soil has greater tilth, better water infiltration and "works easier". Don Lambert, the owner of the Palouse organic farm, told me that a couple of years ago he helped his neighbor with his plowing. He had to run his D6 one gear lower on the neighbor's farm "because of the harder soil." "The field was so hard it rattled my teeth like when I was crossing the road."

Such testimony is commonplace among organic farmers.

The Extent and Type of Organic Farms in the U.S.

The belief that organic agriculture is relevant only to gardens or small farms is completely erroneous, and in the literature is repeated by those who have either not taken the time or trouble to look, or who are being deliberately deceptive.

The USDA's report (2) indicated that their data showed approximately 24,000 organic or "conventional/organic" farmers among the readership of Rodale's THE NEW FARM magazine. That survey was done in 1979. We have since learned that we were reaching only a fraction of organic farmers. The Madden study is showing that on the West Coast, at least, there is a large number of organic farmers that we are not reaching. I would estimate the number of organic or those who call themselves "conventional/organic" at over 40,000 to 50,000.

We are finding much more widespread adoption of organic principles, both in terms of farm sizes and types, than we had previously imagined.

In the West Coast states we are finding that most of the larger purely organic farms do not have animals. I might list:

780 acre wheat farm in Washington State

40 acre apple and pear farm in Wenatchee, Washington

600 acre rice farm in Chico, California

15 acre apple, pear and peach farm in Pleasant Hill, Oregon

80 acre citrus and mixed fruit in Orland, California

500 acres of grapes in Delano, California

There are others that combine animals with grain and hay, tending to have larger acreage.

Of the more recent additions to the readership list of Rodale's THE NEW FARM, the early 1982 mailings drew around 10,000 new readers. Of these,

over 95 percent were in the 500 to 1000 acre size category.

The Information Needs in Organic/Regenerative Technologies

In a detailed survey of the readership of THE NEW FARM magazine, we have found the following in response to the question: What sources of information have been most helpful to you in operating your farm?

Source	Conventional Farmers	Organic Farmers
government publications	29%	24%
county agents	47%	20%
private consultants	14%	12%
friends and neighbors	55%	52%
professional meetings	13%	10%
farming magazines	82%	78%
trade shows	27%	15%
suppliers	40%	13%
farm cooperatives	28%	8%

Organic farmers receive significantly less information from their extension agents. Little of what they do receive is "organic." It may have significant relevance in terms of component technologies.

There is an obvious need for increased extension of organic technologies.

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The Important Focus of HR 5618

To my estimation, the crucial focus is that of Sec. 4 (a) 2, concerned with transition research. We have abundant personal testimony and are generating a growing volume of across-farm comparison data. It is crucial that controlled, replicated, within-field trials be established. These trials, if properly designed, will not only give direct comparisons of the two approaches, but will indicate how to make the transition.

Testimonial data from experienced, commercial farmers who have made the transition from conventional to organic is unanimous in the conclusion that major changes must occur in the soil, taking 3 to 5 years in the transition process.

What are those changes, and what effects them?

These differences, when understood, will give a more full and valuable understanding of the impact of present conventional technologies. What biological processes and systems give organic practices their biological stability and efficiency? What materials and practices are disruptive of them?

It is crucial that the research component of HR 5618 have a "conversion" focus. The small amount of money involved will be "lost in the cracks" without significant impact if it is used for a wide range of valuable and needed component technologies such as legume overseeding, without the "systems" and conversion focus.

University Research Locations

There are relatively few groups in U.S. universities with the interest and organic systems focus to carry out such work. I would suggest the following:

1. Washington State University, Pullman (USDA, state cooperative effort)
2. University of Nebraska (USDA, state cooperative effort)
3. Michigan State University (entomology department, Kellog Station)
4. North Carolina State University (soils department)
5. Cornell University (vegetable crops department) or Penn State University (agronomy, plant pathology)

Conclusion

We are in a time of extreme budget stress as well as economic stress in our farm sector. This bill focuses on research and extension that has excellent short and long-term payoff. The technologies of organic agriculture markedly decrease fertilizer and biocide inputs, so incur the wrath of commercial interests in those products.

Others would agree that "we are already doing a lot in this area." My response is that we aren't going far enough, fast enough. We are not sufficiently imaginative.

We are not asking to transform U.S. agriculture into an organic model. I am suggesting that the sketchy data available indicate that organic agriculture could go a long way toward the solution of today's agricultural problems. To ignore the organic option would be to do a major disservice to

American agriculture. To officially ignore organic agriculture will not stop its progress, but would be a disservice to farmers who need the options it offers.

HR 5618 is a small step toward a sustainable and regenerative agriculture.

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Testimony of Jarlath Hamrock
Cortland County, New York

June 10, 1982

Mr. Chairman, House members, I thank you for this opportunity, and for providing me time to speak before this subcommittee.

I am a crop farmer from Central New York State, one of the richest producing agricultural regions in the Northeast. The area is principally dairy, but New York farmers also cultivate a wide variety of fruits and vegetables, including large crops of potatoes, onions, apples, cabbages, and grapes. The lush grasslands and forage crops in New York - its soils, water supply, topography, and growing season - also make the state suitable for competitive, if not extensive, beef, sheep, hog and poultry production, as well as dairy.

Despite the gloomy outlook for dairymen in the United States generally, one of the factors behind the success of New York's dairy industry, which ranks third in the country, behind Wisconsin and California, is our competitive edge over other markets, (with our large population, NY is a 50% food deficit state), and the fact that New York herdsmen have the ability to grow most of their own feed.

But over the years, with a relatively stronger federal dairy program, the Empire State has experienced a kind of monolithic situation of late. 80% of all

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agricultural revenue in New York is now dairy-related, since even most of the cash crops grown in the state - corn, oats, hay, and grain - go directly into cow feed. I make this point at these hearings since a strong, healthy agriculture is, in part, a diverse and varied agriculture. But what we are beginning to see in New York is a concentration of larger dairies, though most of them are still family farms. In terms of what USDA calls the "structure of agriculture", New York has lost, in a period of only ten years, since 1970, more than 6500 dairy farms. On the other hand, we have maintained our overall milk production.

But again, the point I want to make here is that, with all the concern surrounding the federal dairy program - the surplus and the cost - this trend of losing small valuable dairies could be eased a bit if farmers had the wherewithal in the Northeast to convert to sheep, beef, hog, fruit, or crop production.

Now in New York State the Farmers Home Administration is currently financing, in one form or another, more than four thousand dairies, or about 25% of all dairy farms in the state. Compare this with only

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one hundred beef production loans, and as few as eighteen sheep production loans. About 33% of the FmHA financed dairies, in the meantime, have been delinquent this past January.

I don't get anywhere on this at either Secretary Block's office at USDA, or with Frank Naylor at USDA's Office of Rural Development.

Just what does this have to do with organic farming? The truth is, with our corn/oats/alfalfa system of crop rotation, New York dairy farmers are closer to organic production than extension agents, for example, are likely to admit. But as small dairy farms go out of business, increased sheep, beef, or crop production will only help induce organic culture, and will serve to strengthen our agricultural economy as a whole.

I try to explain this dilemna, also a kind of parable. Today there is a large inventory of milk (some would call it a surplus), because for years the dairy program has been supported at a higher parity ratio than crop farmers and other livestock producers. There has been an incremental move toward dairy production, nationally, as crop farmers and ranchers convert to "where the money is." The dairy program is now in jeaopardy of collapsing,

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dairy farmers, like many crop farmers, are suffering from the "cost-price squeeze", and for the dairy lobby, apparently, the chickens have come home to roost. A Washington columnist said it in yesterday's paper - "nothing fails like success." You cannot have a general (omnibus) farm program that supports milk higher than beef, wheat, corn, cotton, etc, etc, and not expect to have a surplus of one commodity over another. The results of the 1970's - farm strikes and tractorcades - are clearly affecting U.S. dairy farmers, whether they milk cows in Central New York, Minnesota, or in California.

Now our land grant schools, USDA, cooperative extension, ASCS, and the Soil Conservation Service, etc, have paid very little attention to biological agriculture, organic farming, regenerative agriculture, call it what you will, and soon the results may be just as disastrous for the nation's agricultural production - its sustainability - as the inconsistent price support policies of the past have affected crop farmers and ranchers, and now dairymen. No thanks to our agricultural bureaucracy and the research system of the last thirty years, U.S. farmers, the majority of them, are locked into the current conventional approach.

Basically the same kind of imbalance exists.

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Cornell University

Today, when we have a so-called surplus of milk, Cornell University, for example, is putting most their energy into such technology as milk sterilization on the farm, pituitary growth hormones, embyo-transplants, food irradiation, etc - all designed to increase milk production and shelflife. What more are they doing to reduce production costs?

Cornell economists admit that dairy production costs for 1982 will increase by at least 8%, while the price farmers receive for milk will be down again this year, and next. Could organic farming reduce production cost No one really seems to know, though the 1980 USDA study on organic farming indicated that yields for organic farmers were slightly lower for corn, about the same for wheat, but somwhat higher for oats, compared to conventional farmers.

The typical remark you hear, on the other hand, runs like this: "We can't return to the horse and buggy days." Of course Agway Inc., which was born back in those same horse and buggy days, with the help of Cornell dairy specialists, now has little to do with reducing production costs. Agway Co-op Inc, one of the biggest corporations in the Northeast, is a far cry from the original GLF days (Grange League Federation), a New York farm supply co-operative.

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Today Agway is squarely in the chemical fertilizer business. (And in the milk business.) Agway also chairs the Council of Agricultural Organizations in the state of New York, which recommends research at our state's land grant school. Agway controls Profac and Curtis Bros., which dominate the state's processed and canned vegetable industries. In my immediate area Agway is now the only feed supply company available to dairy farmers. Locally farmers have few production alternatives, outside what little extension agents can offer.

I could go on like this, but my intention here is not to incriminate any group or organization in particular, but just to suggest that there could be at least some production alternatives in the Northeast. There could be, for example, a demonstration project at one of the ten-odd land grant universities in the Northeast (not necessarily at Cornell), just to follow the results of an organically-operated dairy.

Now, I have to say, and I am just barely close enough to the situation at Cornell to know, there is little interest for this, and no funding. "Hatch money" is dolled out quite carefully these days, and under the auspices of a professorship. Cornell itself is currently suffering from budget constraints. Every department is, in its own way, financially strapped. Research money even for notable projects

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such as conservation tillage and "living mulch" are now limited. Funding for Cornell's living mulch project, which really is just another name for organic or biological agriculture, has been almost entirely eliminated. This is a new program at Cornell, incidentally, promulgated by some agronomists there which has, I think, great potential.

As another example, a dozen graduate students at Cornell, working with only a $1,000 grant from the Mellon Foundation and a small fraternity grant, have formed what they call an ecological agricultural research collective, and are now studying the results of companion cropping, basically on their own. They have proceeded without major funding from the "Hatch". purse, but still use university facilities.

The research at the university needs, in my opinion, a somehwat more balanced approach, with as an overall objective, reducing costs, boosting production, and conserving resources.

Finally, a 1980 preliminary study that was completed by Cornell's Department of Rural Sociology for the Congressional Office of Technology Assessment, assessing the effects of four technologies - center pivot irrigation, no-till farming, mechanized cotton harvesting, and organic farming - should be reviewed by this committee.

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Soil Conservation Service

Now the Soil Conservation Service in New York, including the Soil and Water Conservation Districts, are struggling themselves under budget constraints. SCS has lost over $200 million from its national budget, and there doesn't appear to be any sympathy directed toward New York State (which loses an average three tons of topsoil per acre, per year) from Secretary Block's "targeted" funding program.

I had lunch recently with SCS's new Chief, Peter Myers, along with several other New York farmers. Mr. Myers is an advocate of conservation tillage and no-till, while farmers in New York are a bit more concerned, I think, with major drainage difficulties around the state, and cuts in staff. New York's Conservation Districts are fighting for every dollar they can garner for the state's overall SCS program, and, frankly, at this time they see organic farming priorities as secondary to critical drainage problems; similar to, say, how they feel regarding no-till. But I feel there is a need to research both no-till and organic farming, as good conservation practices in New York.

USDA predicts that 80% of U.S. farmland that is tillable will be cultivated under no-till practices by the year 2000. I am one hundred percent behind

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conservation tillage. New York has just completed its second annual Conservation Tillage Show, which was a success. But I see some problems with no-till in parts of the Northeast. Cornell has been researching no-till the past ten years. New York's clay ground, its topography, and its shorter growing season make this technology somewhat limited for many of our soils.

But no-till does have its place in the Northeast and all I am suggesting is that organic culture and research be funded on par with no-till. There is great enthusiasm for no-till among land-grant agronomists, but not enough interest for organic farming. You see, Chevron Chemical Company, the manufactureres of paraquat, and Monsanto, who manufacture round-up, similar to Agway, Inc, who process and distribute chemical fertilizers, have little vested interest in organic farming practices. Simply put, it is up to Congress and the USDA to appropriate funds for agricultural research which directs itself toward less reliance on pesticides and chemicals. No one else is going to do it. The system is in place, the interest is there, but the funding is lacking.

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Office of Environmental Quality

In California, as a result of agricultural chemicals, farmers now have to import honey bees in order to insure pollination - bee population has been that critically reduced.

I testified before the Senate last year, on National Agriculture Day, and asked if Congress couldn't provide for New Yorkers farmers the mortality rate of paraquat, round-up (glysophate), and 2,4-D, - all components of no-till farming, incidentally - on honey bees and earthworms. Senator Jepsen told me he would look into it, presumably through USDA's Office of Environmental Quality. That office, unfortunately, has recently been eliminated. It is unfortunate since EPA offices are relatively insensitive to the needs of commercial growers, and an office of this sort at USDA is just what was needed, and still is. The current adminstration has shown its own insensitivity by doing away with such an office.

I won't go on at any length about this, except to say that today there is no data readily available at our own Department of Agriculture on the effects of certain agricultural chemicals, though these same restricted-use chemicals are recommended by USDA.

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Many New York farmers are already apprehensive about no-till technology. They are skeptical about relying so completely on herbicides, insecticedos, fungicides, and fertilizers - all in one application over the field. The management factor is critical. It's going to take some time to develop confidence with no-till, but if certain of these restricted-use chemicals are just too dangerous to the microflora, if they jeaopardize pollination, farmers are going to remain skeptical.

One last example of how useful this office could have been to farmers: In New York, because of acid rain, great quantities of valuable limestone have been moved up north and fed into the Adirondack Lakes that are apparently dying, their fish populations severely reduced from acidity.

The great debate goes on about whether or not acid rain affects soil ph. Well I can tell you that it has, if for no other reason than the cost of lime; when farmers have to pay $25 per ton for ground limestone that only a few years ago was priced at $10 or $12 per ton. There's more to this than inflation. I have spread about 300 tons of lime the past five years, and my farm is only a hundred miles south of the Adirondacks. Acid rain affects New York farmers' production costs, so I guess after all, with this testimony, there is no need for an Office of Environmental Quality to tell us.

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USDA Organic Farming Study

I think that what has been overlooked regarding the 1980 USDA report on organic farming is the attempt by those who conducted the overall study to include conventional farming practices, including conservation tillage and suprisingly even no-till technology, which they observed as techniques of organic farmers. In other words, what we are dealing with here is simply another production alternative, not one form of production that is exclusive over the other.

Forty years ago Louis Bromfield, a strong advocate of organic culture, was not above using chemical fertilizers and herbicides occasionally in order to boost the yield of a green manure crop or a catch crop in his attempts to reclaim abused farmland, only to plow that crop under in order to kill weeds and condition the soil. Rotation, timing, and management was the key. I will, from time to time, practice similar techniques on my farm. I'll fertilize (NKP) a winter crop in the late fall if I think it will help establish that crop before the ground freezes. At other times I feel more confident about organic methods knowing the ground contains, after time, certain valuable trace elements that packaged or bulk NKP can't fully provide.

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Pesticides are a slightly different matter, and recent efforts to incorporate integrated pest management (IPM) should be maintained at all research levels, from USDA on down through to co-operative extension. What little IPM extension agents have available at their fingertips is a symptom of how new this technology is.

But for example, when we see the alfalfa start to wilt, our best method of attack is just simply get in and harvest it as quickly as possible, and let it start to grow again. The trick, I suppose, is having only fifty acres of it, instead of having to deal with five hundred acres in a hurry. Organic farmers, like many conventional farmers, are better off not putting all their eggs in one basket. A monoculture obviously is, contrary to what is often believed, more difficult to manage over time than a polyculture. And along these same lines, there is no question that organic agriculture has its place in the Northeast, where topography, soils, and weather are more conducive to livestock and and diversified farming than perhaps in the south or the west. In 1979 the Northeast Agricultural Leadership Assembly, of which I was a member, endorsed certain research of the same kind without, I believe, calling it "organic".

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Organic farming is not for everyone, but the USDA study was an attempt to show that organic farmers are simply looking for alternatives over the long run, alternatives that will improve yields, soil and water rescurces, and reduce production costs. Organic farmers are not, as some would like to think, adverse to using chemicals or technology. Compared to conventional farmers they are few in number (1%), but by and large they are sophisticated agriculturalists. In the United States we should be more concerned over, as one Republican House member put it before Congress recently, the sustainability of our national agricultural production, and organic farming, as one alternative, could help us along in that direction.

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Appendix

I spoke with a crop farmer recently from the Genesse Valley, a man probably with some of the finest land in New York State, who cultivates a few thousand acres of vegetables and grain. He is a good farmer, with good land, who uses every possible technology, including sprays, fertilizers, pesticides, rotation and irrigation. He told me something was wrong - he couldn't make any money to speak of for the past half dozen years, and was just barely breaking even. He felt it wasn't just the "economy".

As we spoke what impressed me most was his candid explanation of the pros and cons of each technique. "A good rain," he said, "will outdo all the thousands I can spend on irrigation.... And nothing will replace soil fertility, none of the sprays or fertilizers my money can buy."

Soil fertility is the last work here. Pesticides and fertilizers are the answer for soils lacking fertility. Organic farming could be the long run alternative that might reduce our complete dependency on these supplements.

According to Cornell University meteorologists, we may be in the middle of an extended drought in

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the Northeast. The south and the midwest are, to some degree, still suffering from the effects of drought, and there are those who suggest that we may return again to dry-land farming in parts of the west. What the ground needs, wet or dry, is humus, moisture, and life, and all the supplements and additives of the green revolution won't help much if, through poor farming practices, we lose what we inherited when American farmers started years ago to break ground on this productive land of ours.

I thank this committee for its time. I am the New York State delegate for the American Agriculture Movement in Washington, DC, and will try to answer any of your questions.

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USES OF ORGANIC RESIDUES AT NEBRASKA EXPERIMENT STATIONS

Warren W. Sahs
Assistant Director
Nebraska Agricultural Experiment Station
Lincoln, Nebraska

The Nebraska Experiment Station has a long history of working with organic residues and fertilizers as nutrients for crops, as shown in the accompanying chart.

History of Nebraska
Research With Organic Residues

Time Period	Areas of Emphasis	Span of Years
1912-1937	barnyard manure	25 years
1935-1955	legumes in crop rotations, barnyard manure	20 years
1955-1970	commercial fertilizers solid, anhydrous, liquid	15 years
1970-1975	liquid animal wastes, feedlot manure efficiencies of commercial fertilizer	5 years
1975-1978	legumes in crop rotations paunch manure (composted) feedlot manure (composted) efficiencies of commercial fertilizer	3 years
1978-	continuation of legumes in crop rotations with manure, composted paunch and feedlot manure, efficiencies of commercial fertilizer, and composted sewage sludge	

In 1910, the Scottsbluff Experiment Station, near Mitchell, Nebraska, began operations. Sod was plowed and since 1912 the field has been in continuous corn. The first year corn yielded 50 bushels per acre and for the next 30 years no manure or fertilizer was applied. Corn yields dropped off and stabilized at 20 bushels per acre.

From 1942, hybrid seed corn was used; yields increased, but remained at a constant yield level through 1970. At the same time the plots were split, 12 tons of manure (wet basis) were applied on one-half of the plots. Manure increased the yield level each year for eight years and has stabilized at approximately 100 bushels per acre.

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In 1912 the soddy soil contained 0.10 percent total nitrogen. After 30 years the total nitrogen was 0.05 percent where continuous corn was grown and no manure applied. Upon application of manure for 11 years, the soil nitrogen level increased to 90 percent of the original nitrogen level.

In 1953 the plots were further split, and commercial nitrogen in varying amounts up to 160 pounds per acre was applied resulting in no significant yield increase on those plots receiving manure.

Kisselbach and Lyness, from 1930 to 1955, carried out numerous experiments involving manure and rotations with legumes at Lincoln. In 1951 and 1952, fertilizer treatments were added to these experiments. Due to the allocation of resources and probably a choice of priorities, the shift from rotations to fertilizer experiments began.

Going back to priorities, in the mid 1970's the pendulum began to swing in the other direction. Was the manure and rotation data of the 1950's applicable to the 1970's? With improved machinery, more horsepower, better seed of improved varieties, less tillage operations, would the results be the same? In 1974, in an Agronomy Department research planning session, legume rotations were considered for Lincoln or the Northeast Station, but once again priorities prevailed and no work was initiated.

In February, 1975, an interdisciplinary team from the station planned a needed research project. This project, well designed, was aimed for research results for the dryland farmer, and would use legumes and organic residue (feedlot manure) as a contributor of nutrients for an oats/clover, corn, soybeans, and corn four year rotation as compared to continuous corn with chemicals. Unfortunately, the plot area was in a drought area for three seasons (1975-1977) causing moisture to be the limiting factor. No significant differences appeared in corn yields in 1979, an excellent corn year. However, in 1980, a hot dry year, the organic (manure) plots yields were significantly greater than the continuous corn plots. This result compares with other investigations indicating that the organic (manure) treated plots have a beneficial buffering effect in stress years. However, in 1981, an ideal year for corn, the reverse was true, wherein the continuous corn plots yields were significantly greater than the organic treated plots. No significant differences in soybean yields have occurred in 1980 and 1981. Extensive 1980 and 1981 soil tests in the top 12 inches indicates that we have a significant accumulation of phosphate and potassium occurring in the organic (manure) plots. Organic matter

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content is gradually increasing in the organic plots compared to the continuous corn plots. There is an apparent build-up of grassy weed seed in the organic plots.

In the late 1960's the Agricultural Research Service provided substantial support in the form of personnel and funding for research on liquid and semi-solid animal wastes. These investigations were primarily centered at the University of Nebraska Field Laboratory near Mead, Nebraska.

Using annual applications of 40-80-160 tons of feedlot manure per acre per year on a silty clay loam soil, results on irrigated corn showed no significant contamination of the underground water nor contamination of the runoff water from the plot area. During two years of the experiments at Mead, there were two overnight rainfall events of more than four inches. Annual manure applications had greatly decreased soil compaction and increased the infiltration rate of the soil from 0.4 to 1.4 inches per hour. All of the precipitation was retained by the spongy soil surface of the manured plots. Conversion of rainfall or irrigation water through recycling organic residues (manure) can reduce the cost of crop production through retention of excessive precipitation amounts.

In the mid-1970's, the Agronomy department was supplied private grant funds to investigate the use of paunch manure as a land amendment. Four years of irrigated corn yield data indicate that there is no significant difference between composted paunch and feedlot manure. Treatments were applied equivalent to 30-60-90-120-180 pounds of actual nitrogen, using composted paunch and feedlot manure, and ammonium nitrate. Ammonium nitrate treatments have given the best yields of irrigated corn. Rates of treatments were non-significant.

These yields suggest the plot area carried a substantial amount of residual nitrate nitrogen before the 1976 treatments were applied. In 1979, there were no differences in yields between sources of N or methods of application. No significant differences were found between sources for soil pH, organic matter, carbon/nitrogen ratio or total nitrogen.

This experiment indicates that composted paunch manure and raw feedlot manure can be used as viable nitrogen sources when available to the farmer. Irrigated corn receiving composted paunch manure yielded as well as corn fertilized with raw feedlot manure. When fertilizing with organic residues, a lag effect takes place the first three years due to the slower decomposition rate of the organic residues as compared to the chemical fertilizers.

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August 25, 1981 the Nebraska Agricultural Experiment Station had its first Organic Agriculture Field Day and Farm Tour. The sponsors were well pleased with 150 tour participants, 80% of whom were farmers searching for alternate cropping systems. We have addresses of 500 people who wish to attend the 1982 August tour.

In May, 1982 the Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln named a 12 person Task Force who will develop a "position paper" for the Institute pertaining to the importance and application of Alternate Cropping Systems (Organic Farming) in our research, cooperative extension and teaching programs.

Economic analyses will receive top priority. This position statement will be developed by September 15, 1982.

I thank you for the opportunity of testifying at this hearing. Organic farming is not a panacea. It demands top management, it fits the livestock-grain type of farm. Predictions are that petro chemical based fertilizers will soon double in price, thus possibly we need to explore to the fullest potential the value of alternate cropping systems.

Department of Biology

WASHINGTON UNIVERSITY IN ST LOUIS

June 10, 1982

Testimony to be included in the record of the hearing on HR5618, The Organic Farm Act, by Daniel H. Kohl, Professor of Biology, Washington University, St. Louis, Missouri and William Lockeretz, Research Associate, School of Nutrition, Tufts University, Medford, Massachusetts.

Please permit us to comment on possible legislation which would establish regional centers for the study of organic agriculture.

We recently completed a five year comparison of organic versus conventional mixed grain/livestock enterprises in the midwestern Cornbelt. This study is by far the largest on organic agriculture which has been carried out to-date. The results surprised us. The first surprise was that there were any viable commercial sized organic farms in the Cornbelt. The second surprise was that they did very well. In most years, their income per acre of land suitable for cultivation was equal to that of their conventional neighbors. In 26 measured comparisons of corn yield, the conventional farmer's yield was 8% better than that of the organic farmer. In seven measured comparisons of soybean yield, the conventional farmer did 5% better. Thus, the corn and soybean yields of organic farmers were very much in the same ballpark as that of the conventional farmers despite the absence of any production research or extension support. The reality is also very different from the predictions of horror which one hears. (We did only a few comparisons of wheat yield. Here the difference was substantial and in favor of the conventional farmer). Despite the quite respectable yield on the organic farms, our research indicated that the corn crop suffered from marginal nitrogen deficiency. The report of our research was published in SCIENCE (211, 540 – 547, 1981-copy enclosed), the most prestigious US scientific journal.

Based on the success of our work, we had hoped to move on and investigate intermediate practice. It seemed to us that if the organic farmers had done so well without adding commercial nitrogen that they might do even better by adding about 25% of the nitrogen added by their conventional neighbors (in response to the marginal nitrogen deficiency which we observed). We thought that the organic farmers might also usefully apply herbicide selectively between the rows. We were not able to obtain funds to continue our work. In fact, there was almost no place to apply for funds on research on organic farming. The program at the National Science Foundation (NSF) which supplied our original funds (Research Applied to National Needs) had been discontinued. Our proposal was directed to a small program at NSF on appropriate technology. The program manager was extremely reluctant to fund agricultural research (despite the fact that the program guidelines called for such work) since his program was funded from year to year and a proposal like ours required at least three continous years to produce interpretable data.

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While we enthusiastically applaud your interest in fostering research on organic farming, we do want to point out several potential pitfalls in establishing regional centers dedicated to that research. We think it not immodest to say that our recent research contributed significantly to stimulating scientific and public interest in the subject. Yet, if legislation is cast so that all funds are committed to regional centers, perhaps administered by USDA or through land grant colleges, then investigators like us from private universities will be unable to compete for these research funds. While the earmarking of funds for specific mission oriented work is certainly necessary, we believe the work will be more valuable if a substantial fraction of the available funds are disbursed on a competitive basis. We have in mind a program administered in a manner analogous to the present USDA Competitive Research Grants Program. In such a case all interested parties are encouraged to submit proposals. Awards are made based on competitive merit as judged by peer review.

A second possible pitfall of establishing regional centers is that they might tend to adopt the "experimental farm" model of research. Our experience is that it is enormously important to investigate what is happening on real, functioning farms. A much clearer picture of how a farming system works can be obtained in this way. Examining the function of real farms also should allow researchers to identify the various brands of "alternative wisdom" which is practiced "out there". Both approaches have their respective merits and the blend of the two would provide a greater return on limited research funds than would an exclusive reliance on just one.

The worst possible outcome of establishing regional centers would be for them to fall into the hands of researchers who do not understand what organic farming is. For example, some professionals claim there is no difference between organic farming and simply reducing the inputs of the conventional farmer. They ignore obvious, extremely important differences in the systems of agriculture, like crop mix. Research undertaken in this spirit will certainly "prove" that present practice is the only conceivable practice. It is essential that funds for organic farming research are actually spent for that purpose and not for existing work that is conveniently relabelled as "organic farming research" to tap this new source of funds.

American agriculture has been magnificantly productive. Many find this result hard to argue with. Your encouragement of research in "organic methods", however, recognizes that we must learn more about resource conserving alternatives for achieving high and sustainable production.

TESTIMONY OF DEBBY WECHSLER
CO-ORDINATOR, CAROLINA FARM STEWARDSHIP ASSOCIATION

SUBMITTED IN SUPPORT OF HR 5618-- THE ORGANIC FARMING ACT OF 1982
TO THE HOUSE AGRICULTURE COMMITTEE, SUBCOMMITTEE ON FAMILY FARMS,
FORESTS, AND ENERGY

JUNE 10, 1982

The Carolina Farm Stewardship Association welcomes this opportunity to express its support for the Organic Farming Act of 1982 (HR 5618). We consider this legislation an important step in the right direction towards the recognition and support of organic farming and the development of an ecological, sustainable agriculture in this country.

Carolina Farm Stewardship Association is a non-profit membership association of farmers, gardeners, consumers, and food distributors who are concerned about the health of the land and the food it produces. We are committed to ecological farming methods, the production of healthful food, and the preservation of the family farm. We count many successful organic growers among our members.

Our organization was formed in 1980 in response to many of the same needs which have prompted this legislation: concern with the future of agriculture and need for a better information and marketing network for alternative growers and those conventional growers seeking to change their farming methods.

We continue to feel these needs strongly as we seek information to improve our farming, as we try to advise each other and non-member growers on farm practices, as we seek experts to lead workshops at our CFSA conferences. Organic growers and experts are few and far between; but not because they are unsuccessful farmers or because they don't know what they are talking about. The reason is that all the vast research systems and support structures of our government and universities have gone to support a different style of agriculture that is highly dependent on large machinery, that requires heavy use of fertilizers and pesticides, that is capital- and energy-intensive, and that mines the soil. That agricultural system is destroying our farms, our farmers, and our agricultural future.

It is also providing consumers with food that is often not fresh, often highly processed, often laden with pesticides, often lower in nutritional value. It is symptomatic of this that our organization is receiving more and more requests for sources of fresh, wholesome produce from environmentally allergic individuals whose bodies have become sensitized to the chemicals in their foods and environments.

The need for change is clear. A very few statistics will sketch out the contours of an agriculture in trouble. North and South Carolina have lost 25 farmers a day over the past 25 years. We lose thirty pounds of

topsoil to erosion for every pound of food put on the table. In the South, one inch of topsoil is lost every nine years. Pesticide use in this country has increased six-fold in the last thirty years, but we lose almost twice as much to pest damage now as we did thirty years ago. We use six calories of energy to produce one calorie of food. While U.S. farmers are the most efficient per man/hour, compared to other countries, they rank far down the scale in efficiency per acre, per unit of energy, or per unit of capital.

We clearly need to reduce our appetite for non-renewable resources and our dependence on expensive and harmful chemicals. The research proposed in this bill will help extend the concepts of the organic grower to meet the needs of a larger proportion of our American farmers.

Organic growers are usually serious, and often successful farmers who are concerned with the consequences of their practices. They choose both old and new methods-- ones of ancient validity and modern innovation. They are guides for change, often stubborn, isolated, and visionary, at the forefront of the changes which must begin to take place if agriculture is to continue.

Carolina Farm Stewardship Association does have some concerns about the bill. The experience of organic growers in their past dealings with university and extension personnel has often been less than positive. Often, organic growers and their practices have been ridiculed, ignored, or misundertood. We question whether there is an open attitude and enough sympathy and understanding of our methods among extension, university, and USDA personnel to adequately carry out the necessary research and extension activities. On both sides, the biases and distrust are long-standing; but perhaps this legislation will be the start of a more constructive relationship.

We suggest that the programs in this act be designed from the start with the full involvement and advice of organic growers and grower organizations. We urge that for each Pilot Project Research Center, an advisory committee of growers be chose, to include the volunteer farmer-experts and others in the area, who will help design and oversee the experiments. We urge that this constructive participation be written into the bill and not merely discretionary.

We also suggest that some of these research funds be made available to non-land grant colleges and other organizations. While it does make sense for land grant colleges to do agricultural research, other schools, institutions, and organizations may be much better prepared or already have a better track record. Diversifying the forms of this research effort at this embryonic stage will help us design even more effective research programs in the future.

This legislation is a small expenditure towards creating a viable agricultural future. It can nurture the seeds of a new agriculture. These seeds, with the proper care, will grow and flourish and spread. Carolina Farm Stewardship Association applauds this progressive legislation and stands ready to help put it into effect.

Statement submitted by Dr. Regis D. Voss, Professor of Agronomy, Iowa State University, for the Hearing on H. R. 5618 by the Subcommitte on Forests, Family Farms and Energy.

Production agriculture today has a range of crop production technologies from which to choose. These technologies include: crop sequences and rotations; crop varieties that have a range of resistance to diseases and insects and are adapted to local environments; nutrient sources ranging from legume sources of nitrogen, organic wastes, and natural occurring minerals to processed or manufactured nutrient sources; and natural and synthetic pesticides to control insects, weeds and diseases.

Choice of the technologies for a crop production system is determined by the crop producer's preferences in the organization of the farm business and economics. The consequences of the crop producer's decisions can result in personal satisfaction, economic gain, and a beneficial or deleterious effect on his land resource.

A very brief review of the developments in the past 50 years is helpful to put today's production agriculture in the midwest in perspective. Crop rotations containing forage legumes were grown in the 1930s. These legumes provided nitrogen to the following grain crop, usually corn. Animal wastes were returned to the land, lessening nutrient depletion. Rock phosphate and some processed phosphorus fertilizers came into vogue in the late 1930s and early 1940s. Phosphorus directly increased grain yields as well as forage legume yields, which in turn provided more fixed nitrogen to the following grain crop, further increasing grain yields. Fertilizers were applied to corn in the 1940s, in minute quantities by today's standards, and greatly increased yields. Nutrient depletion had been occurring for many years due to farm export of livestock, livestock products and/or grain. Shortly after World War II nitrogen fertilizer became available in increasing quantities at low cost. Crop producers were no longer dependent on forage legumes and animal wastes for nitrogen for grain crops. In this time period phosphate and potash fertilizers, herbicides, and insecticides became increasingly available. These available technologies permitted crop producers to meet the nutrient needs of choice of crops and control pests that are affected by changes in crop sequence, all independent of crop rotation and utilization of the crops produced.

Choice of the available technologies by crop producers is deemed to be based on economics, i.e., cost of the technologies and the price in the market place for the producers' products. Because the technologies were developed and put into use over an expanded period of time, we now have a generation of people who neither understand nor appreciate the evolvement and consequences of choice of technologies in crop production.

New improved crop varieties and changes in mechanization are not discussed here because these are not central to the discussion and are independent of choices of other technologies.

As the technologies were developed and made available by the private sector, federal and state research institutions explored the efficacy and efficient and safe use of each technology. Based on sound principles and theory the research results were extended by the Cooperative Extension Service to crop producers. No ideology was and is currently expounded upon, but the understanding of the consequences of choice and use of technologies has been and continues to be the major educational thrust. In recent years Integrated Pest Management (IPM) has helped provide an understanding of selection, use and timing of certain technologies.

Now we have brought before us the issue of "organic farming" vs. "conventional farming". Perhaps the only distinction that can possibly be made is that "organic farming" does not use manufactured chemicals such as fertilizers and pesticides. "Conventional farming" has used and continues to use crop rotation, legume nitrogen, animal wastes, and agricultural limestone in addition to other available technologies. In the continuum of available technologies, where is the line drawn to create an ideology separate from other crop production practices?

With regard to the current proposed legislation, H. R. 5618, and specifically section 4, subsection a.1. and section 8, subsection b, 5-year pilot projects are proposed. This is sufficient time only to establish rotation experiments before meaningful data can be obtained. Iowa has been conducting research on the effect of crop rotations containing legumes and green manure crops on the nutrition of the following corn crop and on soil physical properties since 1917. One particular set of current experiments has been continuous for more than 20 years. The effect of limestone on nutrient availability and crop yields has continued to be studied in Iowa with one experiment dating from 1950. (The USDA Study Team's report on Organic Farming, "Report and Recommendations on Organic Farming", did not report or cite the scientific or extension publications resulting from this and other Iowa research dealing directly with or related to practices used in and directly applicable to "organic farming".) Two extension and two research papers from Iowa State University are included as attachments to indicate that research is being conducted on crop rotations and use of limestone and that the research results are part of the educational program for Iowa crop producers.

Intercropping is suggested in H. R. 5618 as an alternative farming practice, but the success of this endeavor may depend on the proper choice from the entire range of available technologies. Intercropping is not necessarily related to use of any one set of technologies.

The beneficial effect of crop rotations containing close growing crops, e.g., forage legumes, on reducing soil erosion and thus maintaining soil organic matter levels has long been recognized. The Universal Soil Loss Equation, A = RKLSCP, contains the term C that involves among other things crop rotation and crop residue management. The choice of a rotation con-

taining the forage legume alfalfa is independent of ideology but may be dependent on technologies such as limestone, fertilizer phosphorus and potassium, and an insecticide or biological methods to control the alfalfa weevil so that the crop may be maintained.

If fuel costs increase as forecast, the costs of all energy based technologies will increase correspondingly. As crop producers make economic decisions, they undoubtedly will choose technologies that have lower energy inputs and costs -- other things being equal. The economic competitiveness of crop rotations containing legume crops, which fix atmospheric nitrogen needed to supply the nonleguminous crops, such as corn, with the nitrogen they require, is improving. Other less intensive energy using technologies will be examined. The efficient and judicious use of animal wastes will be of greater interest to crop producers.

If it is perceived that it would be beneficial to crop producers to have available to them information and tehcnologies to reduce energy use and thus costs and to maintain and improve our land resource, then appropriate research and the educational activities based on that research should be intensified, independent of any ideology. The mechanisms for conducting this research at the federal and state levels and for conducting educational activities at the state and local levels are in place. Only education based on proven principles and results from well conducted research can have a sustaining effect on improving U.S. agriculture.

There is a continuous need for additional research on some existing technologies, e.g., efficient handling and judicious use of animal wastes to conserve and utilize nutrients contained in the wastes, and the utilization of tillage practices to reduce energy use and to better maintain and improve our land resource. Priorities for beneficial research and educational endeavors can be established without additional legislation and without mandating a specific ideology. The most serious limiting factor now is adequate funding to carry out modern research on communication methods covering the whole range of technologies from the completely "organic" through various technology combinations to the modern "conventional".

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